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ON THE VALUE OF INOCULATION IN PLEURO-PNEUMONIA, AS DISCLOSED ON POST-MORTEM EXAMINATION OF THE BODIES OF THE VICTIMS.

BY PROFESSOR MCCALL, F.R.C.V.S., GLASGOW VETERINARY COLLEGE.

In the month of June, 1887, at the request of the Secretary to the Highland and Agricultural Society of Scotland, I gave evidence before the committee appointed by the directors of that Society "to inquire into and report as to the practicability of making an exhaustive inquiry in regard to Pleuro-pneumonia." An epitome of that evidence has been published and circulated, and as its accuracy has been called in question by Mr. Rutherford, veterinary surgeon, Edinburgh, while giving his evidence in 1888 before the Departmental Committee of the Privy Council, before whom I had also the pleasure of giving evidence, and as the point raised, viz., the value of inoculation as determined by *post-mortem* revelation, is of paramount importance to every member of the profession, I desire through the columns of our veterinary journals to ventilate the subject, and, if possible, to thresh it out.

In answer to the question put to me by the Committee in Edinburgh, "Have you had a practical experience of the results of inoculation?" I answered, "Yes; in one outbreak in a dairy in Glasgow," and on being further asked to state the particulars, I am reported to have said as follows:—

The outbreak was amongst Mr. Salmond's stock at 207, North Woodside-road, Glasgow. He reported that he was suspicious of having Pleuro-pneumonia in his stock. That was on the 8th February, and at that time he had thirty-seven cows in his byre. On examination, it was evident that one of the cows had a chest affection, and as far as I could make out, it was Pleuro-pneumonia. On killing the first cow I found both of her lungs affected. She had well-

marked evidence of contagious Pleuro-pneumonia. The following day we took out other two cows. We had now good ground for going upon, and we had no hesitation in the matter; one animal's lungs were badly affected, and the other animal was only recently attacked. I find the temperature generally ranges from 103° to 106°. Mr. Salmond, hearing so much about inoculation in Edinburgh, was anxious to have his stock inoculated; and after interchange of letters, he was permitted to do so. I said, "You will be allowed to inoculate your animals at your own expense; but you are clearly to understand that you are not entitled to any compensation from the Local Authority. If the inoculated animals show well-marked signs of Pleuro-pneumonia, they will be removed to the slaughter-house, and I will remain the judge." In Glasgow I value the animals, and pass what I think are fit for human food. I said I would not inoculate them myself, or any one connected with the College, for the reason that I am acting for the Local Authority. So Mr. Rutherford came through that afternoon, and the lungs of an animal that had been killed in the morning were obtained for the lymph for inoculating the other cattle. Wishing to experiment with the same lymph, and for a test case, I brought from my farm a cow, seven years of age, that had been always healthy, and within six weeks of her calving. I had her brought to the College along with two yearling Ayrshires and a yearling bull. I said to Mr. Rutherford, "I wish you to inoculate this cow and the two heifers, but not the bull. We will allow the bull to congregate with the two heifers. I wish the brown cow inoculated, and as soon as she has recovered from the operation I will have her put into Salmond's byre." On 9th February Mr. Rutherford inoculated Salmond's cows, and also the cow in calf, and the two yearling heifers belonging to me. I went with him that afternoon, when he inoculated Salmond's cows, after he had inoculated the animals at the College. He first of all took the temperature of all the animals, to see whether they were in health. On completing his examination, he said there was only one above the normal; "she is 102⅓°; that is the one at the top. I think we might safely inoculate her, as well as the others." I replied, "I want you to get a fair chance, and I think it is a pity that she should remain and be inoculated." Mr. Salmond objected to the cow going away, as she had been milking well; but I insisted that it should go. I said, "Are you satisfied that you have got all the others fit subjects for inoculation?" He said, "Yes." The cow Mr. Salmond objected to being removed showed, on *post-mortem*, an old encysted portion of the left lung. I was interested in that animal. It had been bought at the Wishaw sale. The portion of lung was encapsuled, but, at the same time, the

capsule was broken, and I am inclined to the opinion that this was the animal that brought the disease into the byre. I think Mr. Salmond said it was about eight weeks that the animal had been in the byre. Mr. Rutherford inoculated all the other animals that he considered fit subjects; but there were several cows he did not inoculate, as they were about to calve, or had calved within eight days. When I said that I wished my brown cow inoculated he said, "It is not giving her a fair chance; being so near the calving, she may die." I said, "I would risk it." He inoculated her and amputated her tail, and the cow never showed any bad symptoms. The operation was successful, and the calf was born healthy and well. On the same day Mr. Salmond said, "We are badly off for milk, and I have such faith in inoculation that, if you would allow me, we will buy some cows and put them into the byre." I said, "Upon the same conditions as formerly I will take that upon me; but you are to understand that there is no compensation in any circumstances. Those cows, once in the byre, can only go to the slaughter-house; they cannot go to be sold in the public market, but when you are done with them they must go to the butcher." And letters passed to that effect. He purchased on that date—9th February—three cows at the Wishaw sale, and on the 14th he bought two cows at the Paisley sale, for the purpose of being inoculated and thoroughly protected. On 17th February (along with Mr. Rutherford) I visited the byre, and found a cow showing symptoms of Pleuro. I said this cow must be taken away at once. This was one of those inoculated on the 9th, and on *post-mortem* examination both lungs were found to be affected. Mr. Rutherford said the inoculation had not taken. The explanation in this case was that the animal had not taken the inoculation, and that it had been affected with the disease before inoculation. Mr. Rutherford saw it before being slaughtered. On March 1st I required to take another cow and kill it, and I found both lungs bad. This animal was inoculated on the 9th. According to Mr. Rutherford, it was successfully inoculated, the tail was amputated, and it was considered safe; so that if the cow of the 17th was confirmatory of the fact that when an animal contracts Pleuro-pneumonia by the natural method it cannot be inoculated, the case of the 1st March was the very reverse. Both lungs were bad. With the others, it had the tail amputated, was considered to be free from disease, and still it succumbed to the disease. It was one of those in the byre when the disease first broke out. The tail of the animal was amputated on the 16th, and on the 28th I found the animal showing symptoms of the disease, and it was killed on 1st March. On 3rd March I found four cows showing symptoms of Pleuro-pneumonia. I ordered two to be removed, which had

been inoculated successfully, according to Mr. Rutherford, and had their tails amputated. The *post-mortem* took place on the following day, the 4th, and the lungs of both animals were found to be bad. The carcase of one was condemned. The disease had evidently been in existence prior to inoculation; so that we have here again two cows that were inoculated, and took, and their tails amputated, and yet they showed well-marked symptoms of the disease. Then, on 7th March, I ordered the other two cows to be slaughtered. The *post-mortem* examination was as follows: "The brown cow bad of one lung, and encystment commencing in two places. This animal was inoculated by Mr. Rutherford on 17th February, and took. The black-and-white cow had had one lung affected, but less than any animal yet slaughtered, also inoculated 17th February, and took. On 9th March my own brown cow, which was brought to the college and inoculated on the 9th of February, was taken to Salmond's byre, and put amongst the others; she calved a perfectly healthy calf, and she is at the present moment as sound and healthy as any cow. On 15th March a brown cow, in good condition, was ordered to be killed. Back arched, temperature increased, symptoms of lumbago and rheumatic iritis, breathing disturbed, cough, but I could not make out lung affection. Mr. Salmond said, "This cow is in fair condition, and it would be a pity to let her pine away. If she has got any lung affection you will be quite willing to compensate." I said that we would do so, and we took her away. In the *post-mortem* examination the right lung presented three distinct encapsulated masses. This animal was inoculated on 9th February, and took, and was considered in health till 13th March. Two days after that she was killed. I do not think the lung had been long encapsulated; the masses were distinct from one another. You may have a portion of encapsulated lung surrounded by healthy tissue, and you are not able, if the cow is fat, to make out the condition of matters. On 22nd March I was requested to visit Salmond's on account of a cow exhibiting symptoms of something in her throat, but I found no obstruction. The temperature was increased and the breathing disturbed, and as Pleuro-pneumonia was in the byre, she was taken away and slaughtered. The *post-mortem* examination showed a lesion in the right lung, upper lobe, the size of two hands. The inoculation had taken, and the tail had been amputated. This cow was not inoculated till 16th February, and had to be inoculated again, along with eleven other animals. On 21st March a brown cow, purchased at Wishaw, on 9th February, exhibited symptoms of Pleuro-pneumonia. This is one of the three cows bought at Wishaw for preventive inoculation, but as no compensation would be given, I allowed her to

wait till 4th April. I would not have allowed her to live so long, except for the inoculation, in case it should be said that I was in too great a hurry.

April 4th. Brown cow again carefully examined. Temperature, 103°; breath catching, etc. Ordered to be slaughtered.

April 5th. *Post-mortem* examination shows left lung, upper lobes, consolidated. The upper lobe of the right also slightly affected. This animal was taken into the byre on the 9th of February, the day of purchase, but she was not inoculated by Mr. Rutherford till the 16th, so that she remained six days exposed to the contagion before the preventive remedy was applied. To make certain, she was again inoculated on the 24th, and again on the 29th. The tail was amputated. There were no cows excepting my own cow, that was inoculated previous to going into that byre. The Ayrshire cow stands as a monument of what can be done in regard to a sound animal. I approve of inoculation, provided it be performed on the animal before it has been exposed to the infection. This animal entered the byre apparently healthy, on 9th February, remained seven days exposed to the contagion, was inoculated on the 16th, again on the 24th, and again on the 29th February. She remained apparently healthy till the 21st March, in all two days less than six weeks. The inference is that six weeks is the incubative stage. She had apparently taken the disease almost as soon as she entered the byre, but the week's delay in inoculation allowed the animal to contract the disease by the natural method, and therefore she was affected when inoculated. My opinion is that the lymph of Pleuro-pneumonia is a material that requires to be handled with the very greatest care. I think if it is mixed with blood or pus it will be inoperative, or if you allow it to be exposed to the atmosphere. It will only give real and effective inoculation if you kill the animal and make use of the lymph immediately after death. It should be used the very day, and taken from a portion of the lung that is as little affected as possible, and free from pus and blood. I am sure that many of the failures are due to not attending to this.

Reasoning from other facts (known to me), I would say that lymph taken from the lung, hermetically sealed in a bottle, would not fail; but at the same time I would prefer the lymph taken from the subject fresh, and there and then inoculated. I should not be surprised if it did not take effect if kept any time. In Glasgow there is no inducement to inoculate, because the cattle are kept in the byres. They do not go out to the fields. They give milk, and when they do not give milk to pay their way they go straight to the slaughter-house.

I do not think an animal slightly diseased and inoculated would

be saved, or that inoculation would stay the progress of the disease. I think in most cases it would intensify the natural malady. If a healthy animal is inoculated with the proper lymph it is safe, but I cannot tell for how long. Given an animal with sound lungs and inoculated, and the inoculation has taken, I consider it is safe to mix with other animals. I am going to allow the animals that were inoculated at the College to remain and grow up, and when I have an outbreak of Pleuro-pneumonia, and they are in milk, I will put them into that byre. I would in certain circumstances advise Local Authorities in this country to adopt inoculation, and in other circumstances I would not. I think it is too late to inoculate when you have got the disease in a byre, for this reason, that if the animals have been in a dairy and breathing the same atmosphere, if one has succumbed to the disease, seeing there is an incubative period of six weeks, several others will be labouring under the malady when you inoculate. There is no doubt that some animals resist the disease for a time, and by inoculation you may save them.

Having now transcribed the facts and circumstances connected with the Salmond outbreak as they came under my observation, I shall now place on record such portions of the evidence given by Mr. Rutherford before the Departmental Committee as refers to the same subject.

MR. RUTHERFORD'S EVIDENCE.

(Chairman.)—I notice that, among other statements, you say "successful inoculation confers immunity"?—Yes.—Is that your opinion?—That is my decided opinion.—Is it your opinion that an animal will not accept inoculation more than once?—It is my opinion.—Is that your experience?—That is my experience.

(Professor Brown.)—During your experience with inoculation what results have you gained?—I have never failed to arrest an outbreak. There was only one outbreak in my life where I never came to a satisfactory conclusion, and that was where the inspector on the tenth or twelfth day after inoculation stepped in and killed the lot. I never got a chance of coming to a conclusion about that. But my remarks, of course, apply to the aggregate results, and the individual results also of nearly 150 outbreaks. Have you known any instances of inoculated animals, that is to say, animals that you have inoculated yourself, taking the disease afterwards?—Not after I had pronounced them safe. By saying that the operation confers immunity when it is successfully performed, what do you mean exactly by the word?—I mean by the word "immunity" that it will not contract the disease or give the disease.—That it is absolutely protected, do you mean?—I think so.

I have absolutely no knowledge whatever of a single instance to the contrary. Still, you say that it is not always possible to detect when Pleuro-pneumonia exists?—There are very few cases indeed of animals that are under the constant care and constant supervision of a veterinary surgeon where it would not be possible?—Very few indeed.—But still there are some?—There are some where you can make a mistake about it; it might be something else, for instance; but there are very few?—I think exceedingly few. I should not like to say how few. They must be very few, for I cannot tax my memory that I have met with many, if any at all, that I have never been satisfied about.—Still, it comes to this, at least, that if inoculation were adopted, as you suggested, some diseased animals would certainly be inoculated?—Yes; but they would not remain alive afterwards.—How do you mean?—A man who undertakes to arrest a case of Pleuro-pneumonia by inoculation is not satisfied with the first inspection—he has no right to be satisfied with his first inspection of these animals. I myself examine them individually, every animal generally auscultatively and thermometrically, and not once, but many times, until I finally dismiss them. If my suspicions are at all aroused that animal must go down. The result is that in my experience I do not know of any animals that have ever afterwards come into the hands of the slaughterers that exhibit signs of Pleuro-pneumonia; that is, speaking of my own practice.—Still, there are cases, are there not, where you have not followed the animals to the slaughter-house?—Yes; there are a large number of cases, no doubt; but I have done all I could always, through my clients, to follow these animals up and make inquiry about them. I never once in all my life ever had any complaint come back to me about an animal that had been under my treatment by inoculation. Never once has any such animal been found to be the subject of disease after being fattened, say.—Still, the records of the slaughter-houses show that a large number of inoculated animals have been found to be diseased after slaughter?—I should like to draw a distinction between inoculation, speaking generally, and my own practice. I say that no animals that have been under my own immediate care have been found to have been the subject of disease after being slaughtered. I do not know of a single one. That, of course, raises the question, again, of the operator.

(Sir G. Macpherson Grant.)—In your evidence before the Highland Society you are reported to have said, "I am prepared to admit the possibility that a percentage of animals may have the disease in a limited area of the lung; such cases have come under my notice, but it is not my experience that these animals, after

passing through inoculation, disseminate disease." That is to say, that these animals were diseased without being discovered?—I am very glad that you have opened up that question—exceedingly glad, because I think it is the one question that should be definitely settled, either by a consensus of evidence or by some demonstrations. I must tell you that in my dealings with the disease I occasionally, in isolated outbreaks, have come across cases where it was possible, or where, if there was such a thing as an animal being left with a disease of an extremely limited area, which I could not detect, that I should expect to find the disease break out amongst fresh animals placed amongst them. I can put my finger upon outbreaks of that kind, and I am very glad that you have asked Mr. Biggar to come here, because his is one of those outbreaks. Mind you, there are very few; there must be very few, because I have not met with them. I simply admit the possibility and the probability, from the appearance of the animals themselves, and from the history of the outbreak; but I have never met with such cases. I have never met with such animals that are left and dismissed by me after inoculation communicating the disease to others.

(Mr. Bowen-Jones.)—Will you please refer to page 34 of the evidence given before the Highland Society? It is not your evidence, but I have no doubt your attention has been drawn to it. On that page there is a reference to Salmond's case?—Yes; there are lots of things there I should like to correct.—Do you agree with Mr. McCall in this: "According to Mr. Rutherford this animal was successfully inoculated, the tail was amputated, and it was considered safe"?—No.—You do not agree with Mr. McCall in that statement?—No, I do not.—Do you admit that the animal was inoculated?—Yes.—Do you admit that the animal contracted disease?—There I do not admit the correctness of Mr. McCall's statement.—Do you know the animal I allude to?—I do not now. I will tell you why I do not know the animal. Mr. Salmond is a very old gentleman, not able to manage his own business; his son manages it for him. It is not the first occasion on which I inoculated for Salmond; as Professor McCall has stated there, it is the second.—Is this statement of Professor McCall's correct: "On March 1st I required to take another cow and kill it, and I found both lungs bad. This animal was inoculated on the 9th. According to Mr. Rutherford, it was successfully inoculated, the tail was amputated, and it was considered safe; so that if the cow of the 17th was confirmatory of the fact that when an animal contracts Pleuro-pneumonia by the natural method it cannot be inoculated, the case of the 1st March was the very reverse. Both lungs were bad"—

is that correct?—I presume it is, because there were several cases.

(Chairman.)—Is the description of this particular case on March 1st correct?—I do not recollect the dates, but I know it was an outbreak I had a lot of bother with.

(Sir G. Macpherson Grant.)—"This animal was inoculated on the 9th"—is that correct?—That would be correct. "According to Mr. Rutherford, it was successfully inoculated, the tail was amputated, and it was considered safe"—is that correct?—That is not correct.—Then you do not consider that the animal was successfully inoculated?—No; because I had already, ten days after the operation, informed the owner that several of the animals were diseased, and that he should report them.—"The tail was amputated"—is that correct?—Yes.—"And it was considered safe"?—No, that is not the case, because I could not say the animals were safe when, at the same time, I informed the owner that they had the disease.—Then you directly traverse Mr. McCall's account of that animal?—Yes.

(Mr. Stirling.)—But with regard to the change that you have just observed as taking place in the lung, do you mean that inoculation arrests it at that stage?—Yes, I infer so; but I tell you again I have not met with it. In *post-mortem* examinations I have never been able to meet any inoculated animals with the disease.—You have inoculated, I think, 5,115 animals?—Yes.

(Mr. Bowen-Jones.)—We get conflicting opinions in this report of the Highland Society as to the points which you say have been definitely settled?—However, these minor points are very easily settled. The point which, to my mind, must be settled by a series of experimeats conducted in the face of the disease is whether, under a vigorous system of dealing with the disease—killing the diseased, killing the suspected, and inoculating the remainder—it is possible for any to be left that are capable of afterwards communicating the disease, and whether they have actually communicated the disease or can do it. That is the one point. I hold that if inoculation is successfully and vigorously carried out such animals cannot exist; and if the worst came to the worst, and occasionally, from a mistaken operation, one or two, here and there, did escape and cause an outbreak somewhere else, put the same thing in operation again, inoculate, and you arrest the thing at once; but it would not occur very often; it would be exceedingly seldom. It never occurred with me, and I do not think it would occur so frequently as to become a question that would ever be a serious one.

(Chairman.)—You said if you inoculated an animal with Pleuro-pneumonia in its system the disease would develop itself within three

weeks ?—Yes, it would ; generally earlier.—Is it true, then, that in Mr. Salmond's outbreak in Glasgow, referred to by Mr. McCall, although you inoculated on February 9th, cases occurred as late as the 9th of April, two months after inoculation ?—That statement does not convey to you the actual facts of the case. It is an incomplete statement, very incomplete indeed, and a very misleading statement. There actually were three lots of cows.—Then do you imply that the returns which are sent by the Local Authorities cannot be correct ?—I have no doubt that they are correct to this extent, that that is the date on which Professor McCall put them down, but my explanation of the case is a very different one. There were actually three lots of cows in that man's premises ; that is to say, there was the lot that I inoculated, there was a lot that was left simply because they were unfit for inoculation, and were subsequently inoculated, and there was the lot that he purchased in to be inoculated immediately after the outbreak was reported. —I want to ask you whether any of the cattle inoculated on February 9th showed the disease on April 9th ?—Yes, they did ; but they were reported by me, not very many days after the inoculation, to the owner. I have over and over again said that it must not be held that because cattle do not exhibit the disease at the time of inoculation and examination, they are free from it ; but I say this, that before a given time they will exhibit it. These animals did exhibit it, and they were pointed out by me to the owner for him to do his part ; that is to say, bring them to Mr. McCall's notice. He never did so, and I do not think Mr. McCall was attending the byres as closely as I was ; I was in the byres every other day almost.

(Mr. Bowen-Jones.)—Do you know of any cases where inoculation has taken successfully more than once on the same animal ?—No, I say it is impossible.—Is inoculation always effectual ?—Yes, inoculation will undoubtedly always arrest and stamp out Pleuro-pneumonia.

In a forthcoming number of this Journal I shall refer, in the first place, to the objections which Mr. Rutherford has taken to my evidence, and in the second place I shall give in detail the history of a recent outbreak of Pleuro-pneumonia on the same premises, and I shall by *post-mortem* and other evidence prove that Mr. Rutherford's inoculation of Salmond's stock in February, 1887, not only did not arrest the spread of the disease at that time, but that it actually carried it on, and was the cause of a second outbreak in June of the present year.

ON PROLAPSUS OF THE RECTUM DURING CASTRATION, AND INVERSION OF THE BLADDER DURING PARTURITION.

BY A. E. MACGILLIVRAY, BANFF, N.B.

THESE accidents are by no means so uncommon as might at first appear; their comparatively dangerous nature renders them at first sight rather unwelcome and unheard-of occurrences. But that they do pretty often take place, and stagger the practitioner rather severely, cannot be denied.

Mr. Peter Beattie, in the September JOURNAL, favours us with rather meagre details of two such cases—the one with a seemingly favourable ending, and the other with the reverse. I cannot say that I consider at all satisfactory the details given in either of Mr. Beattie's cases: he leaves too much to be supplied by the imagination of his readers; more especially is this so in the case of "inversion of the bladder." We all know the very serious nature of this accident during parturition, and I consider it rather a strong call upon our credulity to be told that, after "the bladder was removed, partly by the écraseur and partly by l'gature, "*the patient never showed a bad symptom.*" How, in the name of wonder, did she manage to get rid of her urine after such an operation, without showing any abnormality and "bad symptom," as Mr. Beattie is pleased to call it? There are records of numerous cases of excision of the bladder, with full details of the operation and its effects, but I am safe to say that this is the first case in which "the patient never showed a bad symptom" after the operation.

Mr. Beattie, for our benefit, ought to have told us what steps he took when he endeavoured to return the bladder to its normal position; and, failing to accomplish this, when he proceeded to excision by écraseur and ligature he should have given us full details of his *modus operandi*, more especially when it was such a decided success. It is all very good saying in half-a-dozen words that the bladder was removed by écraseur and ligature—but how? Did he operate close at neck of bladder, or below entrance of ureters? I rather suppose he operated by ligature and écraseur—ligature first, and applied écraseur below his ligature—and not, as he would lead us to suppose, by écraseur and ligature. Then, as to after effects, does the patient's urine dribble away continuously and keep vulva in perpetual irritation and thighs excoriated? Or does it gather in quantities inside vagina, and only escape now and again from vulva? Mr. Beattie's report leads one to suppose that the mare urinates as formerly, which is simply utterly impossible.

Not long ago I was called, late one night, to a foaling mare, from which, messengers said, it was impossible to get the foal away. As a matter of course, I lost no time in getting alongside the mare. I found two legs protruding from the vulva, with ropes attached, and was told that they were forelegs, but that the head could not be got up into position. The mare was frightfully excited and straining very severely, and, besides, was getting up and down every two or three minutes. I explored and felt for foal's head, but failed to discover any signs of it. I, with assistance, got the two legs pushed pretty well back into their original position in the mother.. An assistant with small arm held them there, and, while I again proceeded to explore for head, I discovered a large, round, soft-like body occupying the vagina and, in fact, almost protruding from vulva. On getting a light brought near, and expanding the vulva, I at once saw that the bladder had become everted, and that it must have done so after we got rid of the fœtal legs, as it was quite fresh and uninjured, and not so very large as reported in some similar cases. Having informed owner what had taken place, and warned him of the danger, I got the mare on to her legs, and proceeded to return the everted viscus to its normal position and state; this I accomplished by lateral compression of the body and steady pressure on the fundus of the everted bladder. Being so very recently turned inside out, I had a comparatively easy reduction. The meatus urinarius being greatly distended, I was afraid if the mare went down that the eversion would again occur; so I at once had her temporarily slung to roof of house with ropes. She became extremely excited, and threw herself sideways in the ropes with all her four feet in the air! In this position she was unapproachable; so, with the intention of making her return to a standing position, I gave her a slight tip with a rope's end over the shoulders, when, to my utter astonishment, the wood-work of roof gave way, and my poor patient was soon lying recumbent on her near side all covered over with the *débris* from the collapsed roof.

As she made no attempt to rise, I got two assistants to hold down her head, and immediately explored her vaginum and found matters *in utero* quite altered; head within reach, and, after considerable careful manipulation and traction, was got into pelvic cavity; and, as the cords had never been removed from the legs, we had merely to pull these extremities into their normal position alongside head, and within fifteen minutes after the fall of the mare we drew away a living foal! The placenta followed almost immediately, and the bladder seemed likely to follow the latter, as it had again become everted, and had assumed a more irritable appearance. I adopted the same system for reduction—namely,

compression on side and pressure on fundus of the everted viscus —with like success. To prevent further trouble with after pains, I injected six grains of morphia hypodermically, and all did well.

In the above case it must be allowed that everything was in favour of the operator, the eversion being discovered and reduced within a few minutes of its having occurred, so that the viscus in itself never deviated much from its normal state. In Mr. Beattie's case things were quite the reverse, being in general against the operator—a fact which may have been against his giving us a free, full, and comprehensible history of his case of "inverted bladder."

Turning to Mr. Beattie's other case of prolapsus of the rectum during castration, I may be allowed to remark once more that this accident is far from uncommon, and generally easily reduced; but as regards the accompanying rupture, which Mr. Beattie says he only discovered on the fourth day after the operation, I am somewhat sceptical. There are only two ways in which this rupture or rent could have occurred—namely, either during Mr. Beattie's futile endeavours to return the rectum, or, not having accomplished this, during the process of allowing the horse to get once more on to his legs—a very risky proceeding with over a foot of the rectum dangling about outside. In either case, however, Mr. Beattie ought to have observed this transverse rent of "quite sufficient size to allow the hand to pass through," as with such a rent very considerable hæmorrhage must have taken place *at once*. This rectal rent seems to me to be enveloped in some mystery, and Mr. Beattie gives us no details to help us to elucidate the mystery. All he says is: "Slight colicky pains, no fæces for four days, rupture of rectum, and death from peritonitis."

Queries: What caused the gastralgia? wherefore the obstruction? how was blood in and rupture of the rectum only discovered after four days? and where principally was the peritonitis observed? The elucidation of these points is absolutely necessary to enable us to reap any benefit from Mr. Beattie's "rare case."

I will conclude this communication with a few notes on three cases of *prolapsus recti* during castration, which have occurred in my own practice. The first case happened as far back as the 28th January, 1869, on which day I castrated a fourteen-years-old cart horse. After he was thrown and properly secured he commenced to strain most violently; and just as I was about to slit out the first testicle out came fully fifteen inches of the rectum! After a minute's consideration, I resolved to leave the prolapsed rectum alone till I had completed the castration; so I merely rolled the "prolapsus" well and carefully up with a clean cloth, and quite deliberately finished my operation. Having done so, I then

successfully reduced the prolapsus and allowed the horse to get on to his legs; he was gently exercised for some twenty minutes, and then put into the stable. About an hour afterwards he was attacked with colicky pains, rising and lying frequently, and kicking about. I gave him a laxative in combination with a strong opiate; this settled him a little, but I had to remain with him for several hours, after which he got quite over it, and, notwithstanding the severe season (January), made a splendid recovery from castration.

My other two cases both occurred in yearling colts; and in each of these colts there unfortunately happened, in addition to the protrusion of the rectum, an escape of several feet of intestines per the inguinal canal. In the first case the intestines and the rectum both escaped while the colt was under operation; and in the second colt the rectum only appeared during the operation, the bowels coming down about a quarter-of-an-hour after the operation was over and the animal once more on his legs. In both colts I reduced the *prolapsus recti* at once; I also replaced the fallen intestines by, first of all, putting all back within the scrotum and stitching up wound there; and then, introducing my hand and arm per rectum, I hauled, with extreme difficulty and great caution, the dropped bowels back through the canal into the abdominal cavity. The rectum did not appear again in either case, but within an hour the intestines had again descended and thoroughly filled the scrotum, which soon became very tense and painful. In the first of these two cases I reduced the scrotal hernia a second time, and tightened up the scrotum with a wooden clam; this was of no use, however, as the poor animal died about twenty-four hours after the operation.

In the second colt, where the bowels did not descend till after the operation, and after he had got on to his legs again, the inguinal canal seemed to have given way altogether, as when I introduced my hand and arm per rectum, my hand actually slipped through the abnormal opening down into the scrotum, till I could easily feel it with my other hand externally at scrotum! This colt succumbed during the night.

The two latter cases were very aggravating indeed, more especially as the first colt was really a magnificent animal, and full of life and vigour.

OPHTHALMIA.

BY THOMAS WALLEY, M.R.C.V.S., PROFESSOR OF VETERINARY MEDICINE AND SURGERY, EDINBURGH.*

MR. PRESIDENT AND GENTLEMEN,

In offering a few remarks on this subject to you to-day, I would like it to be understood, 1stly, that the subject was the choice of Mr. Kidd, and, 2ndly, that it must not be accepted, in any way, as an exhaustive paper; it has been written rather with the view of bringing the matter before you in a comprehensive form, and for the purpose of initiating an interchange of views in reference to several points of vast importance not only to the veterinary surgeon, but to the horse-breeder also.

Probably there is no branch of veterinary surgery to which less attention has been directed than this, and I am constrained to say that there is probably no subject in which veterinary surgeons display a greater amount of ignorance or more obsolete notions, to which they cling most obstinately.

Even the terms used by some to distinguish its various forms are ancient terms, and ought to be things of the past. I refer in this connection to the ordinary division of Ophthalmia into *superficial* and *deep-seated*, or into *superficial* and *specific* or *periodic*. The use of such terms is justifiable in speaking to ordinary persons; they can scarcely be called scientific, nor, in the case of one of them, viz., "specific," correct.

The word specific has at the present day, amongst scientific men at least, a very limited and very definite application, and there is no one feature of the so-called specific Ophthalmia that warrants the application of the term to it.

The divisions usually adopted by oculists are:—

a. External Ophthalmia.
b. Internal Ophthalmia.

The latter being divided into

(1) Anterior internal Ophthalmia.
(2) Posterior internal Ophthalmia.

In the first division we have

Conjunctivitis,
Corneitis vel Keratitis,
Sclerotitis.

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* Read before the Royal Counties Veterinary Medical Society.

In the second division we have

(1)	Anterior	Aquo-Capsulitis, Iritis, Kyklitis inflammation of the Ciliary circle
(2)	Posterior	Choroiditis, Retinitis, Hyaloiditis.

The latter is frequently spoken of as *Acute Glaucoma*. While *Lentitis* may be an accompaniment of either anterior or posterior, *optic neuritis*, unless of simple origin, complicates posterior Ophthalmia. In addition to these divisions we have also *Panophthalmitis, i.e.*, inflammation of the whole of the eyeball.

It is most largely produced by injuries, usually of a phlegmonous type, and terminates in destruction of the affected organ.

In some respects, a strict adhesion to these divisions is not of so much importance in veterinary as it is in human practice, neither, indeed, can such fine distinctions be drawn in the former as in the latter. Moreover, it is on the whole a rare thing for inflammation to confine its attacks to any one of the structures mentioned in the different divisions; as, assuming the existence of an independent inflammation in any one of them, it would, and in most instances does, readily extend either by continuity or contiguity to another.

Undoubtedly we may have a conjunctivitis or a corneitis pure and simple, but extension from one to the other is easy and is frequent; so with iritis, while it may remain as an independent lesion, it may easily become associated with aquo capsulitis anteriorly, or with choroiditis posteriorly.

In either forms an inflammation may be *acute* or *chronic*, *mild* or *destructive*.

Ophthalmia may be *single* or *double*.

Before proceeding further with my subject, it may be as well to glance at the ***predisposing causes*** of Ophthalmia. In the front rank of these I shall place *hereditary disposition*, which undoubtedly exercises as material an influence in the production of inflammation in animals as it does in man.

There are, I imagine, few V.S.'s who will question that hereditary influences exercise a large share in the production of this disease, but it is as well that we should understand at the outset the nature of these hereditary influences. I presume there is no one amongst you who will for a moment assert that such influence is due to the handing down from parent to offspring of actual disease, or even of any specific causal entity. True, we may have congenital Ophthalmia, but this may arise quite independently of any maternal influence. The tendency that is handed down is a

potential tendency, if I may use the term, and it is wholly dependent upon some inherent internal defect of the involved organ or organs, this defect rendering it or them more prone to be affected by adverse influences, if such are brought to bear, and it must be borne in mind that such liability may be acquired as well as inherited, and it is so acquired whenever the eye suffers from any form of organic or even (although to a less extent) of functional derangement. Even general debility may exercise an important influence in this respect.

I have said we have no specific predisposition to Ophthalmia. This statement will doubtless be questioned by those who consider that equine Ophthalmia is of a rheumatic origin. That such a form of Ophthalmia is common enough in the human subject is a recognised fact, and it is known as arthritic Ophthalmia. That such a form exists in the horse is staunchly asserted by some, and I well remember that some 25 to 30 years ago it was the fashion to speak of the affection as of a rheumatic nature, and to treat it as such, but I imagine that there are few even of those who then entertained that belief who cling to it now. Certainly the anti-rheumatic treatment adopted by those who were of the rheumatic persuasion was of very little curative value.

The acquired tendency resulting from a previous attack is only such as is observed in all other organs under similar circumstances, and there is no more a *recurrent* Ophthalmia than there is a recurrent laminitis or a recurrent mammitis; nor is there any more a *periodic* Ophthalmia than there is a periodic hepatitis; the recurrency and the periodicity being in all cases dependent upon accidental circumstances arising out of the surroundings of the animal itself and acting upon a structurally deranged organ.

The important fact for us to realise is that no matter whether there exists, or does not exist, a special tendency in some animals to eye disease such tendency is materially less to-day than it was twenty years ago; at least we are warranted in arriving at this conclusion, seeing that at that period Ophthalmia was one of the commonest diseases we had to treat, while to-day we meet with comparatively few such cases, and the question naturally arises—How is this? It may be answered in a few words. *Firstly*, it is due to the teaching of the members of our profession that as in man so in animals "like breeds like," and to the warnings and admonitions against the use of diseased animals for propagative purposes, expressed in speech and by pen by veterinary surgeons all over the kingdom.

Secondly, it is due to the greater care that is now taken of domestic animals from a sanitary point of view—a fact due also, I think, to the teaching of the members of the body corporate.

Climatic Influences probably have some share in predisposing to this as to allied affections, as we find that in certain countries Ophthalmia exists to a much greater extent than in others—both in man and animals—but it must be remembered that in some cases climatic influences occupy only a secondary place in the production of Ophthalmia, and that the surrounding conditions have more to do with its production than has any peculiarity of climate as such, and this perhaps refers more particularly to *change of climate.*

In days gone by, it was no uncommon thing to find on examination that numbers of Irish horses became the subjects of Ophthalmia within a few days, or weeks, after their arrival on this side of the Channel, and it was assumed by many veterinary surgeons that they were the subjects of periodic or specific Ophthalmia, as it was called, but no account was taken of the deleterious influence exerted by the treatment to which the animals were subjected *en voyage* or after their debarkation at our ports. In like manner—as I am informed by Mr. Rutherford—Australian horses exported thence to India were found after landing in the latter country to be the subjects of Ophthalmia; a disease which was seldom seen amongst them in Australia.

The influence of such treatment as that to which horses used to be subjected in transit in the production of Ophthalmia will be reverted to hereafter.

Anatomical Conformation.—In speaking of this I do not refer to any textural conditions, except conical cornea, but rather to the general anatomical formation of the eye and its surroundings. Pug dogs are, in my experience, pre-eminently disposed to eye disease, and the only explanation I can offer of this is the great prominence of the eyeball, due probably to arrested development of the orbital process of the frontal bone. In the case of the horse, there are few horsemen, I take it, who care to purchase a horse with what is known as pig's eyes or three-cornered eyes, and yet such a peculiarity is rather one of deficient development of the surroundings than of the eye itself, and no one can say that the pig is predisposed to Ophthalmia.

Another predisposing cause recognised by horsemen is *excess of power or energy* as applied to the horse; thus, a few years ago one used to hear very commonly the remark "that such and such a horse had worked himself blind," and in this there was perhaps more of the essence of truth than often resides in such axioms, for I conceive that it is not very difficult to understand that the "willing horse" is more likely to derange the circulation of such a delicate organ as the eye, by making violent straining efforts, than is an animal of whom it may be said "that he will never kill himself with overwork."

Teething may, in young animals, exercise a predisposing influence, especially in those cases in which irruption is from any cause retarded.

Actual Causes may be arranged under the head of Idiopathic, Traumatic, Sympathetic, Parasitic, Metastatic and Specific, though some of them are predisposing causes also.

(1) *Idiopathic Causes* are more numerous than are any others; but even some of these may very well be included under the head of sympathetic. They are—irregularity of feeding, indigestion, plethora, debility, exposure to cold, or cold and wet, bad hygienic conditions, imperfect lighting, exposure to a super-heated atmosphere or to irritating gases or to an atmosphere surcharged with irritant matters.

Irregularity of feeding probably exerts a deleterious action more by bringing about indigestion, and, as a result, mal-assimilation and mal-nutrition, than by any direct influence on the eye itself; and it can easily be conceived that if there is any inherent structural weakness the eye is as likely to suffer from such influence as is any other organ; or, on the other hand, if such influences are brought to bear on the system, the super-addition of such other injurious influence, as exposure to cold, may be "the last straw that breaks the camel's back," for it is a matter of experience and within my knowledge that sheep in a state of semi-starvation exposed to cold, especially draughts—as from exposure in an open railway truck or on the deck of a ship—are very apt to suffer, and in large numbers, too, from Ophthalmia.

Plethora undoubtedly exercises a material influence both in predisposing to, and in the production of, acute Ophthalmia, as of other forms of inflammation, and here again the influence is more pronounced in the sheep than in other animals.

Debility exerts its influence here in the same manner as it does in the case of all other forms of disease; it is only one link in the chain of events tending to produce or to excite the development of the affection, for imperfectly nourished textures, whether of the eye or any other organ, are especially liable to suffer from sudden nervous and muscular derangement.

Exposure to cold, or to cold and wet, like debility, predisposes to the affection in the first place by lowering the *vis vita*, and in the second place excites congestion and inflammation by bringing about sudden changes in the circulation of such delicate structures as those composing the eyeball. All people who suffer, or who have suffered, from ophthalmic affections (myself among the number) know perfectly well that exposure to a draught—even though it may at the time be scarcely taken cognizance of—is sufficient to excite the recurrence thereof.

Bad hygienic conditions, like the foregoing, exercise a dual influence, predisposing to disease by lowering vital energy, and exciting its development—by favouring the retention of irritant gases or of irritant moisture in a stable or building.

Imperfect lighting. It is a generally accepted axiom (though here, as in other cases, there are exceptions to the rule) that the prolonged deprivation of light not only predisposes to eye affections, but excites their development when the tendency to such exists; hence it is said that pit-horses are proverbially liable to become blind, and although it is not always true, it is so in my experience—at least, to a tolerably large extent.

We can, of course, easily understand that deprivation of light must interfere largely with nutritive activity by diminishing or suppressing functional activity; but allowing this, we can with equal facility understand that excess of stimulation is as potent a factor as is deficient stimulation in the production of ophthalmic derangement.

Prolonged exposure to the refraction of the rays of light from a snow-clad hill-side in winter has long been recognised as the cause of a form of blindness (usually temporary) known as "snow-blindness." Doubtless the excessive constringing effects of cold on the capillary circulation, or the uneven distribution of blood it induces, exercises quite as great an influence in this direction as does refraction. In like manner prolonged exposure to the effects of the reflected rays of a burning sun from a bare hill-side, or chalk cliff, or lime-stone road, produces material derangement in the optic circulation; but here we have the effects of excessive heat refraction in addition.

Several years ago a series of cases of Ophthalmia came under my notice, in the practice of Mr. E. Stanley, late of Warwick, in which no cause could be assigned except over stimulation.

Enzootic Internal Ophthalmia Horse.—In April, 1881, I visited (with Mr. E. Stanley) a farm, a few miles distant from Warwick, and saw five cart-horses, which were all blind from *Lenticular Cataract* in one or both eyes—ages varied from seven to fourteen or sixteen--and had all become blind during last two years. Stable square, very high (no loft), very dry, sweet and clean, and walls whitewashed; lighted by two opposite square windows, one situated N.E., other S.W., the light through which threw a peculiar glint over the interior. Door N.E. or nearly E.

Running at right angles to this stable was a long, low stable, containing several hacks, none of which had suffered; the aspect of this stable was nearly south, and the hacks, on the whole, had been fed a little more carefully than the cart-horses.

Cause.—No cause could be assigned for this outbreak. Could not be from family peculiarity, as animals had been purchased from different people, and had shown no signs of disease in early life. Both Mr. S. and myself thought it due to the aspect of the house and the peculiar light. It may have been due to improper feeding, producing indigestion, or to fright, causing acute Glaucoma.

The effects of irritant gases, or of inorganic irritants, or of physiological irritants, in the production of various forms of Ophthalmia are, I think, universally recognised.

Amongst irritating gases we have ammonia, sulphide of ammonium, sulphuretted hydrogen, chlorine and sulphurous acid, and with these we may class super-heated steam and dry, hot air, sometimes charged with fine particles of hot carbon, as in the exposure of animals to the effects of fires; the fumes of iodine or bromine or of mineral or vegetable acids, and of such volatile agents as the essential oils, and especially that of mustard.

The three first-mentioned gases are found to a greater or less extent in ill-ventilated holds of ships and in overcrowded dog-kennels and stables; and there is perhaps no form of Ophthalmia more serious than that from which sheep suffer after prolonged exposure to the mephitic gases in the holds, or between the decks of ships, though I have often thought and am convinced that there is present here another and more important disturbing influence in the shape of micrococci or bacteria.

Of the inorganic irritants we have fine particles of lime and of other caustics (though these exert also a chemical action), gas lime, fine sand, mortar, or dust, particles of chaff, the beard of barley or of wheat, and the pubes of the pods of such leguminous plants as the Dolichens pruriens. Amongst physiological irritants we may note the stings of venomous insects, such as wasps and gnats, and of certain species of flies; and last, but not least, the irritant action of micro-organisms, and it may be also the spores of fungi or pollen grain. All who have had much experience amongst sheep are perfectly well aware of the fact that in the spring and summer these animals are frequently attacked in large numbers with Ophthalmia, without those in charge of them being able to assign any cause for the attack; and not unfrequently has it been observed that the attack followed on the sheep gaining access (by trespass or otherwise) to woods and plantings near. It often happens that in such situations there is an abundance of wild flowering plants, and I think it can easily be understood that, by the sheep rushing amongst these, large quantities of pollen grain would be liberated, and this lodging on the conjunctival surface of the eye, would act as a powerful irritant in the same way as it

causes schneiderial irritation. Whether this is so or not may be a matter for question, but circumstances frequently point to such a conclusion ; and I have, several times in my life, suffered from the irritant effects of pollen grain in my own eyes. Woods and plantations swarm, too, with insect life.

In this connection it is interesting to note that some time ago Mr. Henry Power expressed the opinion that Ophthalmia externa is sometimes due to the irritation of the Aspergillus glaucus.

In speaking of the action of physiological agents we must not forget that arsenic, potassic iodide, and even potassic bromide will, when administered in excess, induce catarrhal Ophthalmia.

Emotional or Psychological Causes.—It is an acknowledged fact that, in the human subject, acute Glaucoma is often due to great mental excitement, to anxiety, and to fear. I am satisfied that such causes come also into operation in the dog, if not in other animals. I had a case last summer in a cow, while suffering from the effects of inoculation for Pleuro-pneumonia. She was a very excitable animal.

Traumatic Causes.—Injuries may be inflicted on the eye, either externally or internally; the former varying from simple abrasions of the conjunctival layer of the cornea to loss of structure and actual penetration. They are inflicted by the stroke of a whip or stick, by thorns or bushes in animals jumping or rushing through hedges, by the claws of cats, the teeth of dogs, the spurs of cocks, and the horns of cattle ; by nails, hooks, etc. ; by pieces of glass, steel, or other sharp objects lodging on the cornea ; by stroke from horse's tail or by animals rubbing the eye against walls.

Wounds of the eyeball itself are inflicted by the penetration of sharp foreign objects, by gunshots and splinters of shells or other projectiles.

Sympathetic Ophthalmia is seen in one eye as the result of loss of function of the opposite eye, or as the result of inflammation or actual destruction of the eyeball, and it is particularly liable to occur when there is a continued source of irritation in existence. This form of Ophthalmia is very insidious in its attack, and may not make its appearance until the lapse of months or years after the injury. It is possible that it may in some cases originate in some centric disturbance in the optic tract itself.

Parasitic Ophthalmia may be external or internal. The former is due to the irritation of the Filaria lachrymarum ; it is of rare occurrence in this country, but I exhibit specimen forwarded to me some years ago by Mr. Summers, of Sidmouth. Internal parasitisism results from the irritation of Filaria oculi (specimen of which I also exhibit), and occasionally in the human subject from hydatid cysts.

Metastatic Ophthalmia is probably never seen except in cases of pyæmia, where it may be due to the carrying of emboli (infective or otherwise) from some pyæmic centre and their lodgment in some of the capillaries.

Specific Ophthalmia.—Specific forms of Ophthalmia are seen in the horse during the course of Effusive Fever; in cattle in Cattle-plague, and very exceptionally in Tuberculosis; in sheep in Sheep-pox; in pigs in Swine Fever; in dogs in Gonorrhœa and Distemper; and in poultry in Tuberculosis. The only other forms of specific Ophthalmia, properly so-called, which I have met with are those cases of purulent inflammation sometimes met with in dogs, and which are apparently contagious; and erysipelatous inflammation (also in dogs) as an extension from the face and eyelids.

Types of Inflammation of Conjunctiva and Cornea.—The most common type is undoubtedly the catarrhal; we occasionally, however, meet with marked cases of croupous inflammation—such, in fact, is seen as the result of irritation of powerful gases and powerful irritants and in Rinderpest.

Purulent (or Egyptian) *Ophthalmia* is sometimes seen as the result of neglected catarrhal; though it may occur quite independently of this form, it is probably due to some form of coccus.

Diphtheritic Ophthalmia is, in my experience, very rare; it is nearly always due to inoculation, but while allowing this, it must be borne in mind that any distinction existing between these various forms of Ophthalmia is mainly one of degree.

The Rarer Forms of Ophthalmia met with in practice are—

(*a*) Granular—most frequently seen in India.
(*b*) Pustular or Phlychenular.
(*c*) That form of Chronic Ophthalmia designated Cuticular.

Symptoms and Course of External Ophthalmia.—In speaking of these it must be borne in mind that for all practical purposes the symptoms in our patients are objective.

Constitutionally there may be more or less fever and general depression; this, however, is always greatest in internal Ophthalmia or in those due to specific causes.

The local symptoms are more or less swelling of the eyelids; more or less ptosis and photophobia; distension of the superficial veins; throbbing of the adjacent arteries; heat and tenderness on pressure; at the outset profuse lachrymation, due to irritation of the lachrymal glands, which gives place in due course to muco-purulent matter or croupous products. On carefully everting the lids, the conjunctiva will be seen to be injected and swollen (dropsical); there may be ecchymosis and even hæmorrhage; and in the most acute forms the conjunctiva fre-

quently presents a jelly-like appearance. The corneal conjunctiva is in some instances also infiltrated with serum or even lymph, producing *chemosis*, which may extend over the whole surface of the globe; this is best seen in Effusive Fever of the horse. As time goes on the cornea becomes involved; it becomes opaque from effusion of lymph into its structure, which may be of a pure white or of a yellowish colour. The corneal vessels become dilated, and new vessels, having a looped distribution, are quickly formed.

If the sclerotic becomes involved, it assumes a salmon-pink appearance; and here also the pre-existing vessels become dilated, and there is a rapid formation of new vessels. The sclerotic vessels are easily distinguished from the corneal by their linear arrangement. The suffering is intensified under these latter circumstances.

In *Croupous Inflammation* the croupous matter may be exuded in enormous quantities over the whole surface of the conjunctiva; it may collect in jelly-like masses in the inner canthus and palpebral fissures, or it may form a pseudo-membrane over the surface of the cornea.

In *Diphtheritic Inflammation* not only is there a collection of detritus of an ashy-grey colour, but there is also loss of structure of the conjunctiva itself, which readily bleeds on removal of the false membrane.

In *Purulent Ophthalmia*, the discharges are from the outset of a purulent and destructive character, setting up irritation of the edges of the eyelids and of the *meibomian follicles*, consequently the secretion of the latter becomes agglutinous and produces adhesion of the eyelids. It is in this form more than in any other that we have to dread destruction of the cornea, either by progressive ulcerative keratitis or by rapid softening and breaking up of its constituent elements—diffuse *suppurative corneitis*. Collections of pus, too, often take place in the deep layers of the cornea, producing corneal abscess, or, if situated at the lower part, *onyx*. It is in this form, too, that we have to dread penetration of the cornea and evacuation of the humours and also partial or total *staphyloma*.

In the *Granular Form* we have, in addition to the ordinary symptoms of inflammation, the formation of minute granular bodies on the surface of the conjunctiva; these are enlarged papillæ or lymphatic follicles, and they materially aggravate the symptoms.

In the *Erysipelatous* form the sclerotic conjunctiva becomes elevated by effusion of a reddish-yellow coloured fluid, which causes it to extrude between the eyelids and to present a glistening appearance. After a time, however, pus forms.

In *Phlyctenular Ophthalmia*, which is rarely seen except in young dogs, the corneal-conjunctiva becomes elevated in the form of small pustules having a vascular ring around them. These pustules may become confluent and lead to superficial destruction of the cornea.

In *Cuticular Ophthalmia* the cornea becomes opaque, thickened and hardened (sclerosed) as the result of interstitial growth, and resembles a piece of white skin over which a few disegregated vessels take their course; in some instances, however, there is an enormous increase of new vessels, giving to the cornea a fleshy appearance, and constituting *pannus* or vascular cornea. This must not be confounded with the vascular zone which results from marginal corneitis.

The *Symptoms of Traumatic Ophthalmia* are, 1st, those of ordinary inflammation, but in addition we have the existence of the wound itself. This may be in the form merely of the loss of several layers of the conjunctiva without any opacity; on the contrary, it may be in the form of extensive loss of structure with great opacity and the rapid formation of circumferential vessels.

Foreign Bodies may become surrounded by, or embedded in, masses of lymph, which may for a time hide them from observation.

In *Parasitic Conjunctivitis*, the filaria are seen wriggling about in the conjunctival fluids.

Symptoms of *Internal Ophthalmia*.—Many of the symptoms first noticed may be present here, and should it be complicated with corneitis its existence may not be detected until the cornea clears up. In all cases, the eyeball, if carefully manipulated, will be found much more tense than normal, and the animal resents in a marked degree the application of pressure thereto; photophobia is also well-marked. If the membrane of the aqueous humour is the seat of inflammation, it will be observed that the posterior surface of the cornea becomes opaque from thickening of the membrane and deposition of lymph, which may be of a white or yellowish colour.

In *Iritis*, the iris is at first seen to be injected and very irritable, and myosis is more or less marked; in a very short time, however, the iris becomes opaque from the exudation of masses of lymph, and not infrequently these are found on the papillary edges producing adhesion.

In some cases these masses of lymph become torn, and present a jagged appearance. The striated appearance of the iris is lost. The lymph, as in other situations, may be colourless, yellow, or even hæmorrhagic.

If the pupil is not closed it will be observed that the capsule of the lens has become opaque. As time goes on, the lymph thrown into the anterior chamber may degenerate into pus, and produce

the condition known as *hypopion*. The thing, however, that we have most to dread, in addition to adhesion of the pupillary margin, is adhesion of the iris to the membrane of the aqueous humour, or to the anterior capsule of the lens, or to both these structures; constituting partial or complete *synechia*.

Posterior Internal Ophthalmia constitutes the *Acute Glaucoma* of the oculist. In this condition the tension of the eyeball is materially increased, and the appearances presented are characteristic. On looking carefully into the eye it will be observed that the iris is forced close against the posterior surface of the cornea, it has a dull appearance, and its vessels are materially distended. The pupillary margin may be retracted, but there is no exudation of lymph on to its surface. It is also sluggish in its movement, even under the influence of stimuli.

The interior of the eye has a dim appearance, and by using transmitted and reflected light it will be seen that with the former the lens has a peculiar amber colour, while with the latter it has a somewhat sea-green appearance; in course of time the lens may become opaque.

The white of the eye is usually congested, and even the posterior layers of the cornea may be slightly opaque from pressure of the aqueous humour. The great danger to be apprehended from this form of Ophthalmia is *permanent blindness*, *dissolution* of the *hyaloid membrane* and *displacement* of the *lens*, *liquefaction* or *permanent opacity* of the latter body—*cataract*.

Choroiditis can sometimes be distinguished by the peculiar arrangement of the greatly distended *vena vorticosa*, which can be readily seen by the aid of the *catoptric test*, and by the ophthalmoscope. In a short time, however, this excessively vascular condition may be obscured by the exudation of lymph.

Retinitis is also distinguished by the distended state of the retinal vessels and pulsation of the artery, when it can be seen, and not infrequently it is associated with hæmorrhages more or less diffuse.

Injection of the Retina is one of the most valuable signs we possess of the existence of cerebral or cerebro-spinal meningitis.

The presence of foreign bodies in the interior of the eye may escape detection, more particularly if the wound in the cornea and sclerotic is closed, and no history of the injury afforded; moreover, the object may be itself surrounded by lymph, or blood, or both, and thus be hidden from sight.

The *Therapeutic indications* for the *treatment* of *any form* of *Ophthalmia* are—

Firstly—To reduce inflammatory action.

Secondly—To give the parts physiological rest.

Thirdly—To relieve tension.

Fourthly—To favour absorption of inflammatory products.

Fifthly—To prevent consolidation of such products and the formation of new tissue.

Several of these indications are brought about by the same means.

In all cases the animal should be placed under favourable hygienic conditions, kept as quiet as possible, and light excluded. Diet should be low and of a laxative character. Laxative medicines are always useful, but I have little faith in the administration of strong purgatives, aloin and calomel being, both in the dog and horse, most useful and less irritant than aloes itself.

Anti-pyretics may be administered if the symptoms seem to demand them, aconite and neutral salines being most useful.

In debilitated animals tonics may be required. In specific cases treatment generally applicable to such should be resorted to.

Locally, the eye may be bathed and thoroughly fomented with the infusion of arnica, camomile, or poppy heads.

Local blood-letting, by opening the anglionial vein, or by free scarification of the conjunctiva, is of the greatest use; the latter is especially indicated when the conjunctiva is much swollen and injected, as also when chemosis is marked, and may be practised either by the lancet or by probe-pointed scissors, previously anæsthetising the parts with cocaine.

The local applications in external Ophthalmia which I have found of most use are solutions of acetate, of lead, or zinc, combined with infusion of arnica or aqua opii. The objection to the use of lead entertained by some practitioners, on account of its forming the insoluble chloride with the tears, is a theoretical one, and even if a little harm does result, it is more than counterbalanced by the good gained; such at least has been the experience in my own case.

In more severe cases, especially those marked by great sluggishness of the circulation, alum, with or without acetate of lead, or alternatively sulphate of zinc, is most useful; cocaine or belladonna, or, in preference, atropine, are useful as sedatives.

In purulent Ophthalmia, such germicides as bi-chloride of mercury, chloride of zinc, carbolic acid, or iodine may be required; iodoform and tannic acid have both been lauded in these cases; my experience of these agents has not impressed me with their utility.

In granular Ophthalmia I have found dry alum, or dry sulphate of zinc rubbed freely over the granulations, of the greatest value.

In the most obstinate cases it may be advisable to scarify the conjunctiva freely and apply tincture iodine; and probably you are

well aware that the conjunctiva is beaten with nettle by the natives of India in this disease. The action exerted may be two-fold—viz., mechanical and physiological. Again, obstinate cases have been cured by the use of jequirity, and some time ago Mr. Fred Smith applied, with success, a physiological irritant, in the shape of discharge from the eye of a horse suffering from Influenza.

The insertion of setons and the application of blisters to the skin of the cheek, are sometimes of the greatest possible use in sub-acute or chronic cases.

If opacity of the cornea persists after the subsidence of the active symptoms, a solution of potassic iodide may be applied to the surface of cornea, and potass iodide and calomel administered internally. The projection of powdered carbonate of ammonia, of calomel, or of powdered sugar is largely practised and is undoubtedly useful. It must be understood that if the cornea has become pigmented, as so often happens in pug dogs, or if interstitial changes are marked, treatment may be of little avail, though even here it should be persevered with for a time.

If ulceration of the cornea commences, it should be at once checked by the use of nitrate of silver. In human practice the galvano-cautery has been substituted for lunar caustic, with the best results in each case; the object aimed at is the destruction of the micro-organisms which are always present in the spreading zone.

When the cornea becomes very vascular, free scarification, with the application of belladonna, is indicated.

In anterior internal Ophthalmia, the great object to be obtained is the prevention of the adhesion of the iris and the relief of its over-charged vessels. For this purpose atropine is indicated, or a combination of cocaine and atropine.

After the subsidence of acute inflammation, iodide of potass and calomel should be freely administered.

In acute Glaucoma *atropine is hurtful.* More good will be derived from a weak solution of eserin in combination with cocaine. Surgical treatment, however, is of much greater value, and I am satisfied that many eyes might be saved if paracentesis, either through the cornea or sclerotic, was had recourse to more frequently. Iridectomy should also be practised; I have seen good results follow the operation in the dog; here, too, iodide potass. and calomel should be administered immediately the active symptoms have subsided.

In Retinitis I have found cocaine more valuable than any other remedy.

In the case of the lodgment of foreign bodies, an attempt should

be made to remove them. Fortunately, there is now little difficulty in doing this by the aid of cocaine, but I would just remark that the putting of the head in different positions favours the operation, especially in cattle, by altering the position of the eyeball.

If the injury is due to fine particles of glass and similar objects, the instillation of oil of sweet almonds, medicated with prussic acid or carbolic acid, will be found of greater value than the methods usually adopted.

If foreign bodies can be detected in interior of eye, they should be removed without loss of time.

In those enzootic outbreaks occasionally occurring in plethoric sheep, the animals may be bled and physicked and the diet carefully regulated. Animals depastured on snow-clad mountains should be removed to the low-lands.

FIBROMA OF THE UTERUS IN A MARE.

BY H. THOMSON, M.R.C.V.S., A.V.D., CAVALRY DEPÔT, CANTERBURY.

FIBROID tumours of the uterus in mares are rare; but although recorded cases are not numerous, we are not without information as to their having been occasionally noted in connection with pregnancy. A case, however, has lately been observed by me which, as far as I can ascertain, has no connection with pregnancy whatever. The details are these:—

Cavalry depôt, mare No. 73, five years old, was admitted to the infirmary on the evening of the 20th July last, showing symptoms of abdominal uneasiness, and treated accordingly. On rectal examination, a swelling, in shape and size like a distended bladder, could be detected; and as the mare had not urinated since her admission, the catheter was passed, but only a small quantity of urine escaped by it. In a short time decided labour-pains set in, and continued at intervals for about two hours, a strongly smelling fluid, in colour and odour similar to mixed, amniotic, and allantoid fluids, being voided at each expulsive effort, until a tumour, in size and shape somewhat like an elongated equine heart, came away, and the mare at once appeared to be at ease. She was made comfortable for the night, a further examination being deferred until the following morning.

On examining the mare by daylight, she was found to be lively and bright, feeding well, and apparently none the worse for her previous discomfort. A few clots of blood were found in the vagina, and the os uteri was open. A quantity of carbolised water was injected into the vagina, thoroughly washing it out; but this treatment was found to be unnecessary after a few days, the mare

continuing to progress satisfactorily until she was discharged to duty on August 20th.

The tumour was externally white, firm, and smooth, with a small lacerated pedicle at its base. On cutting into it, it was found to contain several cysts, each rather larger than a large walnut, and filled with fluid similar to that evacuated during labour. It was at once cleansed, and having been placed in a solution of Hydrarg. perchlor., 1-1,000, was forwarded to Professor Smith, at the Army Veterinary School, Aldershot, by whom it was examined, and to whom I am indebted for a description of it.

ARTERY TORSION FORCEPS.

BY S. E. NASH, M.R.C.V.S., RICHMOND, YORKSHIRE.

THE above woodcut represents a little instrument which I have designed, and which Messrs. Arnold and Sons, London, have manufactured for the use of the operative surgeon. It does away with the troublesome taking up and ligaturing of arteries when performing an operation. It is very simple in construction, and easy to work with. When an artery is severed, you get hold of it with the inner forceps, which have a spring catch; when secured, lower the outer forceps and grasp the artery below the spring forceps, and hold them tight together with the thumb and finger, and twist the ebony ball round until the artery is severed. The instrument can then be removed, and you can proceed with the operation, dealing with all vessels exposed in the same way. It might be used with advantage in the operation of docking, by securing and twisting the coccygeal arteries, thereby doing away with the hot-iron.

ACUTE NECROTIC PERICHONDRITIS OF THE LARYNX IN A PIG.

BY PROCTER S. HUTCHINSON, M.R.C.S., ASSISTANT-SURGEON, THROAT HOSPITAL, GOLDEN SQUARE, LONDON.

As cases of idiopathic perichondritis of the larynx in the human subject are rare, and when they do occur the suspicion of syphilis as a cause is often difficult to eliminate, the following case happening in one of the lower animals is important. It occurred some

years ago in a fat and otherwise healthy boar pig, and was obtained by my father, by whom the animal had been seen.

The animal suffered from symptoms exactly resembling croup, the breathing being stridulous and very difficult. The onset had been rapid ; at any rate the pig had been urgently ill for only a few days. No special cause could be assigned for the attack. As there seemed no likelihood of recovery and the dyspnœa was great, the animal was killed. On *post-mortem* examination the effects of the inflammations were found to be most marked around the cricoid cartilage, a portion of which was removed and its place occupied by inflammatory products ; indeed, a considerable portion of the cartilage had exfoliated, leaving only a small portion at the lower and inner part. It is to be noted that no considerable suppuration had attended the process. The necrosed fragment was embedded in a soft granulation structure, with only a very small quantity of puriform fluid. There was general œdema of the larynx, which explained the dyspnœa. The other cartilages were healthy, and no breach of surface had taken place anywhere.

I have been unable to find in any of the books on veterinary subjects, any mention of perichondritis of the larynx in animals. I find in Mackenzie's work, "On the Larynx and Trachea," p. 282, that he records three cases of primary inflammation of the cartilages, all in patients over sixty years of age—two men and one woman. It was the cricoid which suffered in each case of primary disease. He says : "The idea of Dittrich that the disease arises from ossification of the cricoid cartilage, leading to pressure on the soft parts against the vertebral column and subsequent necrosis, is probably erroneous." There was no ossification in this case ; and the animal, although adult, was not senile. The specimen has been forwarded to the College of Surgeons' Museum, in which as yet there is no similar one.

It remains exceedingly difficult to suggest any plausible cause for such an attack of laryngitis as that described, but I may repeat that the case is very valuable as conclusive proof that such may take place quite independently of any specific influence. That the inflammation was catarrhal is perhaps most probable.

SUCCESSFUL TREATMENT OF A FRACTURED JAW IN THE HORSE.

BY S. BAILEY, V.S., OLDHAM.

On the 22nd day of June, my immediate attendance was requested to a valuable five-year-old brown cart horse belonging to John Thomas Mansley, Waterhead Mill, Oldham. The messenger

informed me that the horse yoked to a lurry had taken fright and run away down a very steep hill, and come into violent collision with a churchyard wall, and received very serious injury. On arriving at the stables, I found the horse suffering from several wounds and bruises on various parts of the body and legs, more especially about the head and facial bones, with considerable hæmorrhage from both the mouth and nostrils. For the purpose of arresting the bleeding, I ordered a copious application of cold water. After it had somewhat abated, I made an examination of the mouth, and discovered a longitudinal fracture of the superior jaw in a straight line with the division of the central incisors, both of which were knocked on a twist inwards, leaving a very prominent split of the jaw, with a corresponding rupture of the palate across the bars and gum. It is customary with me to go prepared to treat ordinary cases, but certainly not fractures, neither is it advisable in but very few cases for veterinary surgeons to make the attempt, for fractures in the horse are more formidable than in the human subject, for many reasons. In the first place, we cannot use the same appliances, the same spelks and bandages, nor keep the animal in the same state of quietude. It is impossible to enjoin it to keep itself in this, that, or the other position, which greatly militates against success, not but that we have an equal disposition in the bones of one as the other to take on the restorative process. Then again, if we make the attempt and fail, it will have a tendency to reflect somewhat on our professional reputation, especially amongst a class of people who know no better, but who, as a rule, are generally found the most flippant with their lingual muscles, which may be compared to a race of horses, which go the faster the less weight they carry; such babblers often take possession of a subject, as a highwayman does of a purse, without knowing its contents, or caring to whom it belongs. There is another very important matter which should never be lost sight of in such cases, which is the probable amount that it might cost our client before we should be able to pronounce the patient convalescent and fit for work. I remember the late Professor Spooner, when lecturing on fractures, very wisely remarking that there could be no satisfaction in treating a case of fracture if there was a possibility that the animal might eat its head off before recovery. But I am rather diverging from my case. After somewhat taxing my professional abilities as to what course to pursue, I determined to attempt to reduce the fracture, and for this purpose procured a portion of a cigar box and constructed it into a spelk about three inches long, but not quite as broad as the jaw. I then rounded one end of it so as to fit the posterior portion of the incisors; about midway on each side of it I cut out a notch that would admit a broad

tape, which I tied once round it, leaving about half a yard of tape on each side. I then placed the pieces of the fractured jaw in apposition and secured it by a temporary string round the incisors. I afterwards, with the assistance of my son, placed the spelk to the palate, getting it well up to the posterior portion of the teeth, the side on which the tape crossed undermost. We then brought the tape over the gum, getting it as high up under the lip as possible. After binding it round two or three times, I secured it by tying it at one side of the jaw. I found that my rudely constructed spelk had the result which I anticipated, for it not only had the effect of binding the jaw together, but the tighter I bound it the more effectual it was in bringing the central incisors into their proper position—in fact, it acted on the principle of a lever. I then ordered the horse to be put in pillar reins, and fomentations containing poppy heads to be applied to the swollen parts, and to be supplied with gruel and kept quiet. The following day I visited my patient again, and was pleased to find the spelk and bandage intact; but what might naturally be expected, he refused to take his gruel. I ordered the fomentations to be continued, and tried again with gruel. On the 24th I found that he was taking his gruel freely, and the spelk and bandage was satisfactory, but the nasal bones having been very much injured, an offensive discharge was coming from both nostrils, which continued for about three weeks. I syringed them daily with the following lotion: Acid Carbolic ʒj, Glycerine ʒj, Aqua ʒviij. For the purpose I used an ordinary quittor syringe, to which I can attach a flexible tube about five inches long, which answers remarkably well in such cases. I had occasion to put a gag in his mouth covered with cloth, to prevent him grinding his teeth together; this was only removed when he was supplied with gruel and eggs, and changed occasionally for hay tea and sloppy bran mashes. I removed the spelk and bandage, and replaced it after being on a week. I took from the jaw at various times three small splinters of bone. I kept the bandage on a little over three weeks, and then removed it altogether, and ordered him to have steamed chop, oats and bran, and a plentiful supply of grass. The horse is now working and doing well, and it would take a minute inspection to discover that anything was amiss with either her teeth or jaw.

AN EPIZOOTIC FEVER AMONG HORSES IN SOUTH AUSTRALIA.

BY EDWARD STANLEY, F.R.C.V.S., VETERINARY SURGEON TO THE GOVERNMENT OF NEW SOUTH WALES.

An epizootic and contagious equine Fever broke out in South Australia in 1886, and the infection was carried by teamsters and coaching-horses from that colony to the horses in the Silverton district in the end of that year and beginning of 1887. It continued with considerable virulence during the hot, dry summer, but disappeared with the autumn rains.

During my short trip to Silverton I have seen about 100 cases of the disease, and have been able to make notes from careful observation of a few. The disease having prevailed in that neighbourhood for six weeks, most of the town horses had either recovered or died, and the alarm had consequently subsided. However, fresh arrivals were innocently caught in the contagious trap; and horsekeepers, by fetching in grass-horses to fill up the blanks, kept the contagion supplied with fuel. Necessity compelled them to fulfil their contracts, and familiarity with the disease reduced its terrors, while experience had taught them to avoid some errors in treatment which on the outbreak of the malady had caused fatal results. In consequence of the brevity of my visit, compared with the progress and numerous phases of this interesting disease, my report must be accepted as merely introductory; and I anticipate much valuable information may be added to the subject by veterinary surgeons in the adjoining colonies, where I have reason to believe it is not unknown.

History.

So far as I can learn, the present outbreak was first noticed in a teamster's horses from the Barrier Ranges mining districts (it is not known which colony they came from). A dead horse was left at Mingary, South Australia, early in December, 1886, and the contagion spread through the railway contractors' teams, which were idle at that time, proving fatal to 40 horses out of 150. These were valuable draught animals, in good condition; those young and fat suffered most.

The construction of the Petersburgh to Silverton Railway, also the mining industries, caused the extensive employment of horse labour; and the disease being attributed to a local cause, the *bête noir* being *Euphorbia Drummondi* (which my experiments hitherto have proved to be an innocent weed), misled horse-owners as to its true contagious character; therefore farmers and teamsters easily contracted the disease, and becoming alarmed, rushed away from

the plague spot, taking the disease with them. So the country has become gradually invaded, following the railway line south to Port Pirie, and by sea it has gone to Albany, Western Australia, and north to Cockburn, there crossing the Barrier Ranges into New South Wales. It appeared in Silverton on 12th January, 1887, and has travelled to Corowa, Malculea, the Gorge, Round Hill, Gardiner's Creek, Poolamacca, Purnamoota, Langawera, Double Wells, Mount Brown, Bencannia Lake, *en route* for Wilcannia and Menindie. Mundy Mundy, Mount Gipps, and Burta stations have taken the disease home by buggy horses visiting Silverton, and have infected the home station horses; but by careful isolation the disease was prevented spreading to paddocked horses and breeding stock.

Character.

It is an epizootic contagious equine Fever—a disease which elaborates a virulent element, through the medium of which it is propagated and extended by contagion from horse to horse, and it appears not to spread through the medium of the air or to attack any other animals.

In some respects, it resembles the horse diseases I have seen in other countries, and are described in veterinary works under the names of Epizootic Cellulitis, Rheumatic Influenza, Pinkeye, Purpura Hæmorrhagica, and Epizootic Pneumonia; but it differs from all these very materially.

The fever which follows the reception of the disease germs, although high in many cases, is very variable in intensity; the disease is by no means uniform in attack, location, or subsequent complications.

The blood withdrawn in the early stages is dark-coloured; the corpuscles rapidly coalesce and sink to the bottom of the vessel, leaving a thick, buffy upper surface. During the height of the fever the blood is darker, and coagulates so rapidly that the buffy coat does not appear. In the last stages the blood is tarry, and only forms soft clots.

The remarkably rapid loss of flesh very characteristic in this disease is, I think, explained by Dr. Lionel Beale, who says that "in cases where the body heat rises several degrees in the course of a few hours the germinal matter increases with great rapidity. The capillaries of a great part of the body are found to be gorged with particles of living matter, for the most part descended from the colourless blood corpuscles, while the masses of bioplasm of the neighbouring tissues have increased to twice their normal size." On microscopic examination of the blood, the white corpuscles were conspicuous by their absence; many of the red cells appeared granular; micrococci, diplococci, and bacilli could be detected in

the same field, but, in so far as I could judge, they were not sufficiently numerous to be distinctively pathogenic, and possibly some were accidental contaminations during the examinations. This is a field for further research and experimental demonstration.

The disease shows a disturbance of the vascular system, with alterations in the character of the blood which cause obstructions in the capillary vessels, followed by hæmorrhagic spots, accompanied by organic complications more or less severe.

Cause.

This is due to specific poison, most likely a micro-organism, eliminated from a diseased animal, entering the system of a healthy one, apparently through the digestive organs. In no case has the disease (so far as I can learn) spread atmospherically. Horses carefully kept from contaminated food and water have continued free from the disease, although only a few yards have separated them from the diseased and dying, and it has not spread to paddocked horses along the routes the disease has taken, without actual contact.

Symptoms.

On the first day of illness attracting attention the following symptoms are presented: Drowsy, sleepy appearance, loss of energy, appetite diminished; if worked, is slow to answer the whip, and soon tires; at rest the coat is erect and is harsh and dry, the skin sticks to the ribs, the flanks are hollow, the bowels constipated, the urine scanty and often high-coloured. The con, junctiva lining, the eyelids, and the mucous membrane of the lips-gums, and tongue are of a reddish colour.

Pulse, 60 beats per minute, full and distinct; respiration, 20 to 30 per minute; temperature of the body, 101° to 103°; ears and legs are uniformly warm throughout the illness.

Second day.—Increasing lassitude, muscular weakness, general debility, unsteady gait; if driven, drags the limbs wearily along, carrying the head low, with drooping ears and half-closed eyes; tears trickle down face, and tenacious foam hangs from flabby lips, giving the countenance a most dejected appearance, which is not improved by swarms of flies and dust; heart beats quicker and with force; the bodily temperature is rising; eats and drinks in a dreamy, indifferent way.

Third day.—The eyes are extremely sensitive to light, are retracted in the orbits; the eyelids are swollen, the membrana nictitans is œdematous, and very distinct dark-red blood-spots appear on the now orange-red conjunctiva; the cornea loses its transparency, and becomes dull and opaque, so that the pupil cannot be seen; tears, mingled with a muco-purulent discharge,

continually escape from the eyes and adhere to the face, attracting swarms of flies, the poor animal being too ill to disturb them.

The lips are swollen and pendulous, and masses of tenacious mucus fall into the feed as he eats in a very languid, indifferent manner.

The mouth and sides of the tongue are high-coloured, the mucous papillæ are inflamed, presenting a spotted appearance; the upper surface is covered with a thick, dirty grey fur.

The nostrils are dry and dusty, they are less inflamed than the eyes, and I have not seen any catarrhal discharge.

Fourth day.—The Fever is now at its height, and continues for three or four days with little variation; pulse ranges from 70 to 80 or higher, full and distinct; respirations from 25 to 35, movements thoracic; temperature from 105° to 106°, or even higher, varying two or three degrees in twelve hours. Although nearly blind, the patient is perfectly conscious and sensitive to touch or sound; he will not seek food or water, but takes both when offered; stands in one place, uneasily shifting the quarters by continually flexing first one hind leg and then the other without moving the feet, indicating pain in the joints; does not lie down or give any indication of abdominal pain. The fæces soften with the mash diet, and the bowels act normally; the urine is clear, deep yellow, and often gelatinous. The cornea is milky; the blood-spots in the eyes enlarge into patches of extravasated purple blood, giving a liver colour to the membrana nictitans; the mouth and lips get darker and purplish, and patches of extravasated blood are visible in the vagina.

The appetite never entirely fails, but the act of drinking, especially if the head is held low, is difficult; the lips are frequently dipped before swallowing; the act sometimes excites coughing, but this is painful, as it shakes the aching joints; it is low and suppressed, so as almost to escape notice. The rima glottids is inflamed and œdematous, but there is no external swelling apparent in the glands or throat. The loss of flesh is incredible; a stout horse is reduced almost to a skeleton.

On the seventh or eighth day the crisis is reached; the advent of œdematous swelling in all the limbs is favourable. The joints appear relieved from pain; the respirations are less frequent; the pulse becomes softer and slower; and the temperature is more settled, being two or three degrees lower. Very slowly, but surely, day by day, cheerfulness returns, the appetite improves, and the patient moves slowly about; the evacuations become natural; the eyes improve, cornea clears from the top, leaving a white, saucer-shaped patch and small ulcerated spots; in process of time these clear away. During convalescence the muscles are often function-

ally deranged. Some walk most painfully and exceedingly slow, feeling their way step by step like a man with Rheumatism ; others are weak, they roll like a drunken man ; others droop the quarters, crouching along as if suffering from Lumbago, drag the hind feet along the ground, and appear in danger of falling at every step. Others walk stiff-jointed, as if the swelling was only a mechanical hindrance to progression ; others have cramp in the muscles, causing partial luxation of the petalla ; others have Stringhalt ; others have Laminitis in all the feet. No case of Paralysis or cerebro-spinal disturbance came under my notice. Convalescence after the severe fever is never rapid ; the dropsical swellings extend under the abdomen to the sheath ; it is two or three weeks before the legs get fine, or health and spirits are restored.

The conjunctiva changes from liver colour to a dirty brown, and as the *débris* of disease gets absorbed the deeper spots of extravasated blood show up clearly on the rest of the membrane, which gradually assumes the healthy pink colour.

Course and Termination.

Some cases run a mild course throughout, and may even escape observation ; others go to work with swollen legs after two or three days' illness, and recover ; but the fatal cases occur in horses fresh in to work off grass, or hard-worked horses urged on while the disease is in progress. All rapidly lose flesh and condition. This is due in a great measure to want of nutritious feed. The mistaken practice of bleeding and making the poor brutes walk about while they have a drowsy headache, eyes too painful to open, and shooting pains in every limb—such treatment, aided by drugging, has killed many a good horse ; others turned into a paddock to " rip," where food is scanty and water scarce, being too ill to walk, and die from such inhuman neglect.

If good green food and water were abundant, I think affected horses would make good recoveries, especially if unmolested.

Pathological Anatomy.

Hæmorrhagic spots and stellate patches of inflammation are diffused over both serous and mucous surfaces, effusions of serous lymph, and adhesive inflammation of the coverings of the lungs, heart, liver, and spleen ; also serous effusions into cellular tissues of the limbs and head. In fatal cases the inflammation is so intense as to obstruct the circulation ; local mortification is speedily followed by death.

No animal under my observation died. I made *post-mortems* on four casual cases of fever, but knowing very little of their history or treatment, simply state the cause of their deaths :—

1. A coach-horse.—Putrid lungs.
2. A teamster's hack.—Pleuritic inflammation and gelatinous effusion covering the pericardial sac; also slight enlargement and inflammation of the spleen.
3. A teamster's mare, five years old.—Ill three or four weeks. The spleen was very much enlarged and honeycombed with purulent matter, and the lymphatic glands generally inflamed.
4. A hack mare, three years old; foal at foot.—Ill about three weeks, with spleen in the same condition.

The microscope revealed crowded clusters of bacteria in these spleens.

The small intestines in every case were healthy.

Contagium.—The virus probably escapes from the infected by the mucous membranes—that is, from all the orifices of the body—and appears to be principally communicated by the discharges from the head.

Mode of Access.—This is by contaminated drinking-water troughs, buckets, feed, mangers, boxes, bags, bridles, harness, horse-brushes, rubbers, etc., and also by the evacuations. These, after drying in the sun, are actually eaten by stray loafers (loose horses).

Under certain atmospheric conditions, which are at present incompletely understood, this disease may spread through the air; but usually intense heat with a dry pure atmosphere are unfavourable to such development; while a moist atmosphere with impure air, such as is found in crowded stables, would favour such a result.*

Incubation.—From the time of exposure to infection is from three days to three weeks.

Extension.—Only by contagion from horse to horse, healthy horses becoming contaminated by direct contact with the virus escaped from a diseased animal. It has distinctly followed the horse-tracks used by mails and teamsters, and has been taken to run homesteads by infected animals, and has been arrested on runs by isolation.

Mortality and Loss.—Most deaths occur during first week of attack; some chronic cases also die weeks later. About 10 to 15 per cent. was the average number of deaths during my inquiry; although at Mingary I was told 40 deaths occurred in a mob of 150. The indirect loss from illness is very great. Few horses are fit for work for two or three weeks; many require twice as long, and they lose all their flesh and strength, requiring good food and a long spell of rest; others do not make good recoveries, and

* NOTE.—This disease entirely disappeared as soon as rain set in.

suffer from chronic mischief, linger for weeks, and then die. Good feed and care are necessary to ensure complete recovery.

Immunity.—A team of nine donkeys have drunk and fed with the sick constantly, and have escaped infection. Bullocks are also exempt. About 20 per cent. of horses escape infection, or more probably have it so lightly as to escape observation. I know of no case in which a human being has contracted the disease.

Sanitary Measures.—Carcases should be burned or buried with the sacks, cloths, feed-boxes, and valueless articles used about them. Bits and harness should be put into boiling water. Stable sheds should be limewashed or tarred, and disinfected with chloride of lime, carbolic acid, or chlorine gas. Horse-droppings and manure should be burned, especially on watering reserves and camping-grounds. Local authorities should look to this.

Preventive Measures.—Sick animals should be isolated from the healthy, and every article used about them be kept separate.

The hospital attendant should not mix with the healthy animals, and strangers should be cautioned against visiting the sick. Regulations prohibiting the movements of infected animals should be enforced. As the disease is rapidly approaching to the river Darling, and its flooded condition diverts the traffic to the punt crossings, this is where I recommend the plague should be stayed. The river, forming a natural barrier, would be an invaluable adjunct to assist legislation in preventing the spread of this distinctly contagious disease throughout this colony.

Curative measures consist of absolute rest, with room to move about, pure air and water, soft food, as wet bran, scalded oats, and chaff, given in small quantities and often, and not allowed to become soiled or sour; linseed tea and gruel to drink; green fodder when it can be had.

Saline Medicines.—Give early a dose of sulphate magnesia, 4 ozs. in a pint of water, to relax the bowels; then chlorate or nitrate of potass, 2 to 4 drams, night and morning, in the drinking-water, during the fever, and until the urine is clear and free. Some cases with languid circulation may benefit by beer or porter, carbonate ammonia, aromatic spirits of ammonia, spirit æther nitrous, etc.

Restoration will be promoted by liberal feeding, and the addition of such tonics as sulphate of iron, liquor arsenicalis, vegetable aromatics, bitters, and common salt.

Editorial.

THE PROTECTION OF THE VETERINARY PROFESSION.

Since the obtainment of the Veterinary Surgeon's Act of Parliament, seven years ago, complaints have been made and doubts have been expressed as to its operation. On one side, people possessing more temerity than reason declare that it confers no benefit whatever, neither present nor prospective, on the profession; on another side, there are those who can see no present advantage to be derived from it, though they confess that in the future it will be of service; while on another side, we have complaints that it would be most beneficial if its most important clauses were only enforced with judgment and vigour. In the views of the first two classes we do not at all share, but with those of the third class we are in absolute accord. The Act of Parliament was framed and passed into law, not merely to safeguard the rights of the veterinary profession in these islands, but also to protect the public from imposition and the injury that might be wrought by impostors; and perhaps no profession was ever more liberally dealt with. So much was this the case, that had the Bill not passed when it did, it is more than probable that one so favourable would never afterwards have received the sanction of Parliament. We have examined the Acts procured by other Corporations, and can find none which gives any better *status* than does ours, so far as legal protection is concerned.

In the first place, the Act places the veterinary profession in a legal position before the country, and declares that it shall enjoy certain specific privileges of the utmost importance to it as a Corporation; some of these privileges it never before possessed, while the one or two which it derived through its Charter of 1844 were valueless, because infringement of them was not a punishable offence. All the privileges which the Act confers are legally protected, and no persons other than those whose names are on the Register of Veterinary Surgeons dare usurp the designation of Veterinary Surgeon, while the special titles of the Royal College graduates are specifically fortified by law. Not only this, but no persons other than those so registered may assert that they practise *any* branch of veterinary surgery, or are specially qualified to practise it, without incurring a heavy penalty for doing so. Further than this no law could be expected to go, and no law passed in recent years in any country with which we are acquainted ever did go.

To declare that if a non-registered person gives an animal a dose of medicine, binds up or dresses a wound, or otherwise ministers to a creature suffering from disease or injury, he is committing an offence for which he should be punished, is certainly going beyond what is reasonable and expedient; and such a law, if passed, which is more than improbable, would never be tolerated for a day in any country in which the liberty of the subject has any recognition. Our Act goes as far as any Act ever did, to our knowledge, in this direction; for while

permitting persons who are not registered to minister to animals, or at least imposing no penalty upon them for so doing if they do not transgress clause 17 (1), it yet decrees that they "cannot recover any fee or charge for acting in any manner as a veterinary surgeon or veterinary practitioner, or for practising in any case veterinary surgery, or any branch thereof." Surely this is protection enough; at any rate, those who clamour for more will never, and could never at any time, obtain it, and no other profession has ever received more.

If imposters are still flourishing that is our own fault. The Parliament has given us a powerful and most effective weapon for our protection; if we are so apathetic and foolish as not to use it as it can be used, we are only ourselves to blame, and it might even be said that our apathy was only a sign of our incompetency to utilise for our own and the public benefit a measure which was given us for that purpose.

It is the duty of every person whose name is on the Register to assist in carrying out the provisions of the Act, if he be desirous that the profession is to be benefited by it; but isolated effort in this direction can do but little, and combination is necessary to supervise the enforcement of clauses 16 and 17.

The law embodied in these two clauses is perfectly clear and definite, and there should be no difficulty in enforcing it, if a proper organisation be instituted. We have grave doubts whether the Council of the Royal College offers such an organisation, or whether it should be asked to undertake such a duty as instituting prosecutions for breaches of these clauses. Certainly the Royal College of Surgeons does not prosecute in such cases. We are inclined to think that the proposal made by Mr. Banham, in his letter which appears in our correspondence pages, is worthy of consideration—in fact, it is one we ourselves offered some time ago; for if acted upon, it would give the entire body of the profession a greater interest in carrying out the objects of these most important clauses in a manner not hitherto attempted, and would, at any rate, tend to silence those who so thoughtlessly or unfairly assail the Act and proclaim its inutility, merely because they find it easier to call upon Jupiter to aid them than put their own shoulder to the wheel.

DISCOVERY OF THE MICROBE OF STRANGLES.*

BY DR. SCHUTZ, PROFESSOR AT THE VETERINARY HIGH SCHOOL, BERLIN.

DR. SCHUTZ, whose labours in veterinary bacteriology have been attended with signal success in Glanders and Swine Plague, has forwarded a very interesting account of his work in a new field. He claims to have isolated the streptococcus (or chain coccus) of Strangles. The work has been very thoroughly carried out, as might be expected it would be by so eminent a specialist, unhampered by a Vivisection Act. Dr. Schütz excised a gland from a horse which was destroyed whilst suffering from Strangles, and examined the pus it contained, after staining with watery solution of gentian violet in the usual way. "The pus corpuscles showed the usual appearances, and amongst them were found astonishing numbers of chain cocci

* A Review by F. Raymond, F.R.C.V.S., F.R.M.S., F.R.G.S.

winding about the field. The individual cocci were oval and joined at their poles. Fission took place through the small diameter. Sometimes the chain, or part of it, consisted of diplococci. The cocci were deeply stained, but not dark blue, as is the case with those of Pneumonia, but reddish-blue. Cocci were also found in the pus corpuscles, and were distinguishable from the nuclei by their reddish-blue colour, the nuclei staining dark blue. Dr. Schütz was able to make pure cultivations on and in different media, and then inoculated a number of animals. Mice almost invariably died, and the glands of the abdomen, loins, etc., were found to be infiltrated with pus which contained the streptococci. Rabbits, guinea-pigs, and pigeons appear to be immune against this virus. The inoculations were also carried out upon foals with positive results, but the most interesting case is the following:—

On the 5th August, a pure cultivate of the streptococcus was injected into the nostrils of a foal six or eight weeks old. On the 6th the nasal membrane was greatly reddened and covered with greyish-white mucus. Another dose was injected.

7th August. The membranes were more reddened; the discharge was muco-purulent. Some more cultivate was injected.

8th August. The symptoms were intensified. Streptococci were in the pus. The submaxillary gland rather swollen and painful. Pulse, 60; respiration, 14; temp., 39·5° C.

9th August. Symptoms intensified. Submaxillary gland much swollen and very painful. Pulse, 68; respiration, 14; temp., 39·5° C.

16th August. One abscess burst, and streptococci were found in the pus and also in the nasal discharges.

18th August. Another abscess burst, with the same microscopical results as before. Mice were inoculated from the pus, and died five or six days afterwards.

On the 18th this foal received, injected into the lungs, a pure cultivate of equine Pneumonia coccus, and died of Pleuritis on the 28th. Pneumonia cocci and Adenitis cocci were found. They were cultivated together and injected into mice, causing death, and were found again in them.

Dr. Schütz remarks that now that the cause of Strangles is known, there can be no further difficulty in diagnosing between local lesions caused by this malady and others, such as Glanders or common Pyæmia. However, it is not impossible that many veterinarians will be found for some years to come who will draw their conclusions from other sources. He says that lungs are often sent to the Berlin High School to know if they are glandered or not, and that a positive opinion could not be given in all cases, and asserts that henceforth the difficulty will cease. He sums up his paper as follows: "The coccus of Strangles forms rosary-like chains, which are deeply stained by gentian violet, methyl blue, etc. They do not grow in meat-gelatine peptone nor in agar-agar. In broth they form white flakes at the bottom of the vessel, and in solidified serum they form transparent, glass-like drops. If thinly spread on serum the result is a dry, iridescent coating. The coccus is pathogenic in horses and mice, causing local abscesses and also metastasis." He mentions the peculiarities of other streptococci already known. Thus the streptococcus pyogenes of Ogston grows in gelatine and in agar-agar. The result in mice of injections of small doses is nil, of larger ones Septicæmia occasionally.

The streptococcus of Erysipelas never produces any effect upon mice. The Strangles streptococcus differs from the micrococcus of Kraus and the S pyogenes malignus of Flügge, in that it will not grow on gelatine nor agar.

Dr. Schütz differentiates between simple Strangles (which he calls a

purulent catarrh of the Schneiderian membrane, etc., with suppuration of the neighbouring glands) and metastatic Strangles (which is a specific pyæmia caused by infection of the blood, not by ordinary pyæmic cocci, but by streptococci of Strangles). As to which form of Strangles an animal will suffer from, this will depend upon the dose of the virus absorbed and the vigour of the resistance offered by its protecting phagocytis.

I may add that I have repeatedly confirmed Dr. Schütz's observations as far as the finding of the streptococcus is concerned. I have invariably noted its presence in all pus collected from cases of Strangles.

THE SURGICAL CURE OF ROARING.

FROM reports which reach us, there is reason to fear that operation for the cure of Roaring—which, it should be remembered, is only the *symptom* of a morbid condition—may be prejudiced by attempts at its performance without adequate knowledge on the part of the operators, of the operative and surgical details which must be observed in order to ensure success. Not only must the operation be properly performed, but the subsequent treatment is of quite as much importance. A knowledge of the anatomy and physiology of the larynx is, of course, necessary in order to ensure success in the *manuel opératoire*, and it is apprehended that this knowledge is not always sufficiently accurate to enable all operators to undertake such a delicate business without risk of failure; while the after-treatment demands the careful application of the best skill and judgment. To prevent, as far as possible, the risk of failure, we would recommend those of the profession who can control their impetuosity, to wait until we are able to assist them by publishing directions for their guidance in the conduct of the operation. That operative interference in this serious, and far too common, cause of unsoundness in horses, can be successfully invoked will be evident when it is stated that, of thirty roarers operated on, twenty-two have been cured of their infirmity. Everything is being done to bring within the domain of surgery a condition which has been until lately considered beyond the skill of man to remedy, and which has certainly been one of the most conspicuous of the many stigmata that soil the reputation of veterinary science. Of the pathology of the morbid conditions which lead to the production of Roaring, it would seem there is much yet to be learned; and it is high time that an endeavour should be made to dispel the obscurity which has so long been allowed to envelop a subject of such immense importance to every country which rears and uses horses. In furtherance of this endeavour, we solicit the countenance and aid of those members of the profession who can rightly estimate our motives and appreciate them.

DISEASE IN HORSES IN QUEENSLAND.

THE report of Mr. James Irving, Government Veterinarian, upon the disease which proved so fatal among horse stock near Birdsville and in several parts of the Diamantina watershed early in the year, is now in the hands of the Queensland Government. Mr. P. R. Gordon, Chief Inspector of Stock in that Colony, was desirous that a veterinary surgeon should be sent to the district to diagnose the disease, but none of the local practitioners could leave their practice for the purpose. Some of the owners in the district, however, who had suffered losses from the disease, joined together and forwarded four horses

suffering from the malady to Charleville, whence they were trucked to Brisbane, arriving at the Indooroopilly quarantine grounds on the 3rd July. There they were inspected by Mr. Irving, whose report is appended. Mr. Gordon bears testimony in his covering letter to the Colonial Secretary, to the good offices of Mr. J. A. Henderson, of Morney Plains Station, in the trouble he took in forwarding the horses to Charleville and despatching them thence.

MR. IRVING'S REPORT.

On the 3rd July I visited the sheep quarantine ground at Indooroopilly, and there examined two geldings and two mares, said to be affected with what is commonly termed the Birdsville horse disease. These horses had been sent in from about Thargomindah, and the information I received with them was, "The two worst cases are the big bay horse branded CC9 on near shoulder, and the chestnut horse with the hollow back. The bay mare branded N7H near shoulder was very bad some months ago, but now is as well as they ever get. The black mare was bad some time ago, and apparently got all right, but took bad again on the road coming in." I found them to be showing general symptoms of anæmia—conjunctiva pale, with copper tinge, pulse slow and feeble, respirations slower than normal, condition low. The bay mare was the only one which showed the characteristic dragging of the toes of the hind feet, so often spoken about by observers of this disease. None of the horses, upon being trotted around the yard, showed the symptom of choking, which is another symptom of this disease described as affecting horses which are moved smartly along, after apparently recovering from the disease.

On the 4th July I again visited the quarantine ground, and destroyed the bay mare, and then made a *post-mortem* examination. There was a wasted appearance of the muscles, etc.; the heart, lungs, liver, spleen, and kidneys showed no structural change; there was a considerable effusion of serum into the abdominal cavity; upon opening the stomach found five small tumours beneath the mucous membrane; these were filled with small, thread-like worms (*Spiroptera megastoma*) from $\frac{1}{8}$ in. to $\frac{1}{4}$ in. in length; there was a small opening from three of these tumours, through which the worms gained access to the stomach, where vast numbers of them had bored into the mucuous membrane, which was inflamed and easily detached; besides these, there were numbers of worms free in the stomach. The small intestines were particularly free from parasites, but on opening the large intestines they were found to be completely infested with these small worms, in the first part of the large intestines, named the cæcum; besides these small worms, there were a number of blood-sucking worms, from 1 in. to 2 in. in length, firmly attached to the mucou slining of the bowel.

On the 10th July I found, upon moving the horses smartly round the yard, that the bay horse, four years old, commenced to roar very badly, so much so that he almost suffocated. I destroyed him and made *post-mortem* examination, finding the same appearance of internal organs as in the bay mare, with the exception that there was not such a large effusion of serum into the abdominal cavity; but in this case the larynx was decidedly affected, as there was complete atrophy of the left laryngeal muscles, and on the inner surface of each arytenoid cartilage there was a spot about the size of a horse-bean of extravasation of blood, which looked as if it might have been caused by the two cartilages coming forcibly together during the difficult inspirations.

This disease appears to have been prevalent in the Birdsville district for the past two or three years, and generally comes on after a dry spell, and disappears again when a general rainfall takes place. The symptoms are described by various observers as follows: "The horse gets very sleepy,

and hangs his head low, nearly touching the ground, does not seem inclined to move about and feed ; the quarters tremble a good deal, and very often when the horse is trying to walk forwards he will stagger backwards and sit on his haunches like a dog or fall over altogether, and when drinking at a water-hole is liable to stumble in, and so get drowned. When very bad a yellowish matter runs from the nostrils and the eyes get quite cloudy-looking, with considerable matter about them; the legs also become much swollen. The duration of the disease is from a week up to seven or eight weeks, the mortality being great, and the horses that do recover from the disease are said never to be of any use for work again, as they drag the toes of their hind feet on the ground so much that they are apt to wear away the horn completely, and so expose the bone ; also when cantered or trotted along for a few hundred yards they will be seized with a fit of roaring, which in some cases will absolutely choke the animal and cause him to fall. Teamsters' horses and horses that are travelling about do not seem to be so much affected as station horses.

From the history, symptoms, and *post-mortem* appearances, I consider this disease to be pernicious anæmia, brought about by monotony of diet and intestinal and stomach worms. The horses are living on dry grasses for some months, which monotony of diet so reduces the system that it is then in a poor state to resist the effects of the small thread-like worms which may have been in the stomach for some time, or may at this very time be taken into the animal's system through tainted water ; and it is a well-known fact that when any animal's system gets below par, as it were, then is the time that parasites assume the ascendency and cause so much havoc. We then get deficient assimilation of food, loss of nerve-power, atrophy of the laryngeal muscles, causing the roaring described above, and also serous effusion into the thoracic and abdominal cavities, and in some cases about the spinal cord, causing paralysis.

Preventive measures appear to me to be the only advisable course, as the treatment of numbers of horses in the far-away districts is not likely to be attended with very good results, even in a disease amenable to treatment, which this disease by no means is. I would recommend that a lick, composed of common salt 6 parts, sulphate of iron 3 parts, and bone-powder (made by burning bones and then powdering them) 1 part, be put in accessible places during these dry spells, and also change the feeding-grounds every short time ; even if it is only twenty miles removed it will be likely to keep the animals in better health. With regard to treatment, turpentine will be found one of the most useful and easiest got remedies. One tablespoonful of turpentine mixed with a pint of milk, or, where eggs can be got, add two eggs well beaten, and give as a drench to the horse night and morning, and continue this daily for a week or ten days. After this arsenicum, nux vomica, and strychnine would prove very beneficial ; but, as before said, the difficulty lies in treating horses so far away, as these last remedies require administering under careful supervision.

I have to state, that on the 10th of July the black mare began to show bad symptoms of staggering about, and the eyes were clouded. The mare and chestnut horse have all along been getting in their food daily some of the above lick, but since the 10th of July they have had given to them, in addition to the above, a drench each, composed of four fluid drachms each of oil of eucalyptus and oil of turpentine and two eggs, and they seem to be coming on well ; but I will report further progress.

VETERINARY HONOURS.

LAST year the veterinary profession was somewhat elated at the distinctions conferred upon three of its members by Her Majesty—upon one for civic, and upon two for professional services—and it was a matter for congratulation that the honour of knighthood had for the first time been received by a veterinary surgeon. Distance and scanty information from our Australasian colonies with regard to our colleagues had misled us in this respect, and a valued correspondent in Adelaide now writes to inform us that a gentleman, a graduate of the Royal College of Veterinary Surgeons residing in Melbourne, had already been knighted. This gentleman is Sir Charles McMahon, who graduated in 1852 and went to Australia, where he practised for some years. He then joined as a partner in a banking business, and has been very successful in it, having of course retired from the profession. Entering the sphere of politics, by his great ability and integrity he was elected to several important offices, and was at last chosen Speaker of the House of Assembly in Victoria, during which period he received knighthood in recognition of his services. In the Register of Veterinary Surgeons he appears as McMahon, Charles. It should be McMahon, the Right Honourable Sir Charles. This, though also a civic and not a professional reward, is a step higher than any yet achieved in this direction.

JUDICIOUS FEEDING OF HORSES.

OUR excellent contemporary, the *National Live Stock Journal* of America, frequently contains papers of much value to those who manage and rear domestic animals, marked as they are by scientific knowledge practically applied. The following appeared in the number for August, and as it contains much which is either imperfectly known or little observed in horse management, we venture to reproduce it:—

Many of the ailments of domestic animals are due to improper feeding and care, and the loss resulting from these might be saved by the exercise of more judgment in the management of herds and flocks. Skilful care is especially required with horses, for, on account of the comparatively small size of the stomach, they must be fed oftener and more promptly than cattle. The ox has a stomach capable of taking in the large quantity of about twenty-two gallons, while the capacity of the horse's stomach is only about fifteen quarts. Not only must the horse, on this account, be fed frequently in order to digest promptly, but the quality of the food must be more nutritious. Particularly is this the case when he is put at hard work, for although when idle he can maintain health if fed largely on hay or other bulky food, when he comes to work he has not the time required to eat enough of this to sustain him, and he must have a more nourishing diet. We will again give an explanation of why this is necessary.

In the process of mastication, dry hay becomes mixed with four times its weight of saliva, while oats are only furnished with an amount of saliva equivalent to their own weight. A horse in eating ten pounds of hay loads his stomach with forty pounds of saliva in addition, or fifty pounds in all, whereas, in consuming an equivalent amount of oats, say five pounds, he takes but five pounds of saliva, or ten pounds in all. In introducing into the system a given amount of flesh-forming aliment in the form of oats, the stomach is filled to only one-fifth the extent that would be necessary if the same quantity of nutrient material were given in the form of hay. But the ten pounds of hay with its saliva could not all be accommodated in the stomach at once, but only at three times, unless the organ is to be distended to more than the normal healthy plenitude of two-thirds its full capacity. The five pounds of oats, on the other

hand, with its five pounds of saliva, will not fill the stomach to one-third of its capacity, but leaves the amplest opportunity for freedom of movement and the secretion of the gastric juices.

The grain contains about one-half more respiratory food in a given bulk than the hay, and not more than one-fourth the amount of the indigestible woody fibre, so that in oats and other grains we have at once a doubly nutritious food, with incomparably less superfluous matter, more easily masticated, more readily permeated by the juices of the stomach, and capable of more prompt and thorough digestion. By substituting the one kind of aliment for the other, we greatly reduce the vital expenditure in the work of mastication and digestion, the stomach is cleared and the animal sooner fit for work after a meal, and, what is of no less importance, there is avoided the accumulation of indigestible matters in the bowels, which unduly increase the bulk and weight of the body, hinder the dilatation of the chest and the filling of the lungs, and impair the free movements of the body and limbs in active work.

But the food that will support the horse in idleness must be increased for hard work, and if we attempt this with hay alone, we soon find that the capacity of the stomach is unequal to the demand made upon it. Supposing a horse to have consumed twenty pounds of hay per day, he must have spent at least four hours in its mastication; and, by adding four times its bulk of saliva, increasing the whole to 100 pounds, he must have filled the stomach five or six times to its physiological condition of two-thirds its capacity. For really hard work the ration would have to be doubled; but if we increase it to thirty pounds only, the period of mastication will be prolonged to at least six hours daily, and the mass of material swallowed will be increased to 150 pounds, which will fill the stomach eight times in succession. This state of things is manifestly incompatible with hard or prolonged work, to say nothing of the over-distended belly, the impaired wind, and the soft, flabby muscles, which unfit the beast for anything faster than a walking pace.

The introduction into the diet of a large proportion of grain is, therefore, a condition essential to the obtaining of a great amount of work from the animal machine; but as this is, in a sense, an artificial regimen, it entails a series of dangers that do not belong to the more natural dietary. Some of these may be here noticed:

Overloading the Stomach.—Almost any horse will overfeed himself at a corn bin, but this is especially likely to be the case with an animal accustomed to an exclusive diet of hay. Hay contains only half the amount of albuminoids that are present in the same weight of grain, and when swallowed is mixed with four times its weight of saliva, so that its nitrogenous matters are speedily dissolved out and digested, and the whole can be safely transferred to the intestine. Oats, on the other hand, require a longer sojourn in the stomach, because there is five times as much nitrogenous matter present when the organ is filled with insalivated oats as when filled with insalivated hay. Since this nitrogenous material must be digested in the stomach, and will produce serious digestive disorder if hurried into the bowels unchanged, too great care cannot be exercised in providing against the sudden ingestion of an excess of grain.

Another evil result of overloading the stomach with grain is the paralysis and suspension of its functions. All hollow muscles are paralyzed when over-distended, and if this happens to the stomach of the soliped the danger is extreme. In the first place, the horse can rarely relieve himself by vomiting. This act is prevented by the narrowness of the gullet where it joins the stomach, by the presence of loose folds of mucous membrane on the gastric surface, which close over the œsophagean orifice like a valve, and by the point where the gullet opens being on the middle of the lesser curvature of the stomach,

in place of at its end furthest from the intestine, as in vomiting animals. Vomiting is only possible (1) when the lower end of the gullet has become unnaturally dilated from local disease, or the habit of swallowing air (wind sucking); (2), when from excessive distention of the stomach, by food or gas, the mucous folds are completely effaced; or (3), when the organ has been ruptured and the loose mucous folds done away with by the dragging of the mucous membrane through the wound with the escaping food. All hope, therefore, of the satisfactory relief of a sound horse by vomiting may be set aside. In a similar condition in the ox we could successfully puncture the distended organ and draw off the gas, or even lay it open and empty out its contents, but this is forbidden in the soliped by the fact that the stomach is separated from the walls of the belly by the great masses of the large intestine, which must be transfixed before the gastric cavity can be reached. Then, again, wounds of the abdomen are incomparably more fatal in the horse than in the ox, because of the susceptibility to violent peritonitis. The ox, again, might be relieved by passing a probang from the mouth into the stomach, but in the horse the passage of such an instrument is an operation requiring the greatest delicacy in its manipulation, and could scarcely be accomplished without first throwing the animal, which would in itself be almost necessarily fatal in a case of over-distended stomach. Almost the only hope lies in the attempt to rouse the stomach to contract and force the food on to the intestine. But here new difficulties are met with, for any medicinal agents introduced still further distend the already overstretched viscus, aggravate the suffering, and threaten rupture. Again, the medicines thrown into the stomach only lie there as irritants until they are passed on into the intestines, for the healthy equine stomach does not absorb, much less the overfilled and paralysed one. In the slighter cases only can the accumulated material be passed on into the bowels, and though momentary relief is obtained, it is at the expense of a violent or even fatal intestinal disorder; for the albuminoids, which abound in grain, find in the intestines no digestive fluids capable of transforming them into peptones, but undergo fermentation, evolve gases and cause cramps, inflammations, and ruptures.

Short of such extreme injuries the slighter over-distentions of the stomach impair its tone, lessen the vigour of its contractions, reduce the quantity and alter the quality of its secretions, and lay the foundation of dyspepsia, poor condition, flabby muscles, swelled limbs, and a general unfitness for work.

Long fasts, hurried feeding.—These have a similar tendency to the over-distentions just referred to. While a ruminant has been known to survive over a month without partaking of food, a horse cannot endure long abstinences without serious injury. His stomach, which is so frequently replenished in the natural condition, becomes weak and atonic when long empty, and fails to digest the food that should have been sooner applied. Moreover, food in such circumstances is liable to be swallowed hurriedly and without sufficient mastication, and the weakened organ has to contend with a sudden distention which it can ill afford to bear, and this with food that is difficult of digestion, and hence increasingly liable to irritate.

The lesson, obviously, is to avoid long fasts, and especially long fasts followed by heavy meals of grain, and to feed hard-working animals at least thrice daily, with a moderate amount on each occasion, and at a regular and unvarying hour for each meal. If an animal is inevitably subjected to a long fast, ravenous and hurried feeding should be obviated by giving first a little warm gruel, or a handful of warm bran mash, to be followed, twenty minutes or half an hour later, by the ordinary feed. This has the effect of refreshing and invigorating the animal, and at the same time removing the feeling of ravening and vacuity without incurring any danger, immediate or remote, to

the stomach or bowels. It is sometimes sought to take the edge off the appetite by feeding first a little hay and then furnishing the grain; and in many cases this will answer well, but it has the disadvantage of mixing the grain swallowed with a great accumulation of chewed hay and saliva, with which it is especially liable to be carried on into the intestines before its albuminoids have been dissolved out and digested. Hence this system will occasionally beget colics and indigestions. It is the safest course not to allow the grain for some time after any considerable quantity of hay has been eaten, and still better to give the grain alone; acute hunger having been first appeased, if necessary, by gruel or a little mash.

Watering after a feed.—Another common fault in the alimentation of horses is giving water just after a full feed of grain. The first effect of this is to largely distend the stomach; and the result may be as serious as if the material were masticated grain and saliva. But, should this danger be avoided, matters are not necessarily left in a better state. The sudden and excessive influx of water is likely to wash on much of the contents of the stomach into the intestines before the nitrogenous principles have been digested, and fermentation, extrication of gases, over-distentions, colics and inflammations result. Even this is not all. The application of an excess of cold water on the mucous membrane of the stomach and intestines, causes vascular congestion and violent muscular contractions, so that all tend to digestive disorder of a dangerous nature. Copious draughts of iced water are hurtful alike to man and beast. If it must be taken, it should be in small quantities only and frequently. But a drink of water of moderate temperature, just after a feed of grain, is full of peril to the soliped. Thirst should be allayed before the feed is given; and if any is allowed after, it should be merely a mouthful, until the lapse of one or two hours' time has been had for gastric digestion. After a feed of hay there is comparatively little danger. From the excessive salivary addition to the hay, and the comparatively small amount of its albuminoids, these are rapidly dissolved out and digested, and the further addition of water is often rather favourable than otherwise in hastening its progress into the bowels, where the digestion of its starch, sugar, fat and other respiratory elements may be completed.

Work after a feed.—This is another point which too often receives but scant attention. Almost every one has heard of the experiment made on two dogs, one of which was used in rapid hunting, for the first hour after a meal, while the other lay curled up in his kennel. Both were killed at the end of the hour, and while the idle dog's stomach was found empty, and the intestine full of peptones, the proceeds of the digested meal, the stomach of the hunting dog contained the food unchanged, and the first intestine was comparatively empty. So it is with the horse. The expenditure of the vital energies upon violent muscular effort, arrests or retards digestion; and many a horse perishes from acute indigestion following a meal, which might have been saved had he been allowed an hour's rest before he went to work. But short of acute and fatal indigestions, this maltreatment is productive of weakness and atony of the stomach, of chronic indigestion, with gastric and intestinal catarrh, and, above all, of heaves, through the derangement of the pneumogastric nerve which is distributed to both stomach and lungs.

Watering when exhausted.—Much evil is often done by allowing a full draught of cold water to a horse that is heated and worn with travel, the cold element producing, first the congestion and disorderly movements of the stomach and bowels above referred to, and, later, by sympathy or interdependence of functions, disorders of the muscles, skin and feet (founder). But while excess of cold water is always hurtful, a swallow or two is no more injurious to a horse in a state of warmth and perspiration than to one that is

cool and quiet. It is the excess that is dangerous; and, above all, if the beast is worn out as well as heated by exercise. Then it is that the nervous system is particularly impressible, that the economy is less able to recuperate, and that congestions, chills, spasms and inflammations are most liable to result.

Such precautions are simple and obvious enough, in view of the functions of the stomach in this animal, and yet they are fundamental to the maintenance of good health, which is often sacrificed by their neglect. A careful feeder is indeed the most valuable of equine attendants. Often are studs run down, put out of condition, unfitted for work and subjected to a long train of ails, because their feeder, with the best intentions, is yet deficient in that sound judgment or care which is requisite to maintain a sharp appetite and a vigorous digestion. And frequently, too, are such studs improved, and the expenses for feed, for medical and surgical attendance, and for the replacing of worn-out animals, enormously reduced, by changing the feeder or by introducing a more careful and judicious system in the dietary.

ON THE OCCURRENCE OF PECULIAR ORGANISMS IN THE BLOOD OF HORSES, AND THEIR SUPPOSED PATHOGENIC NATURE.

BY SURGEON-MAJOR D. D. CUNNINGHAM, M.B., SPECIAL ASSISTANT TO THE SANITARY COMMISSIONER WITH THE GOVERNMENT OF INDIA.

In the course of 1880, Inspecting Veterinary-Surgeon G. Evans submitted a report on "Surra" as a newly diagnosed disease very prevalent among horses in the stations of the north-west frontier, and, according to his observation, constantly associated with the presence of numerous peculiar organisms in the blood. He showed that inoculation of the blood of diseased animals into healthy ones was followed by the development of the disease in the latter and by the appearance of the parasites in the blood. At the same time it appeared that the presence of the parasites in the blood was not necessarily accompanied by the presence of any morbid effects in the case of certain animals, for a dog which had been inoculated with blood from a case of "Surra," and subsequently given by Dr. Evans to the late Dr. Lewis for examination, continued for long after, and when apparently in perfect health, to show an abundance of the organisms intermittently in its blood. According to Dr. Lewis they were very similar to, if not identical with, the flagellated organisms discovered by him in the blood of apparently healthy rats in 1878.

Subsequently Veterinary-Surgeon J. H. Steel, A.V.D., reported on "an Obscure and Fatal Disease among Transport Mules in British Burma," which appeared in 1883, and continued to prevail in the two following years. This disease he regarded as a relapsing fever closely allied to relapsing fever of the human subject, and identical with the "Surra" of Dr. Evans's report, being, like it, accompanied by the presence of numerous organisms in the blood. Dr. Steel believed these to be Schizomycetes of spirillar type, closely allied to *Spirillum Obermeyeri* of human relapsing fever. He, like Dr. Evans, found that the disease was communicable from sick to healthy animals by means of inoculations of blood, and that the parasites were then to be found in the blood of the infected ones.

During the course of 1886, an epidemic prevailed among horses, ponies, and mules in Meerut which, according to Veterinary Surgeon W. D. Gunn,

A.V.D., was not of an anthracoid, but of a typhoid nature, the symptoms during life differing slightly from those of Anthrax in various respects, amongst others in the fever being of a relapsing in place of a continued character. The *post-mortem* appearances were described as "very similar to those of Anthrax," with the exception that there were ulcerations in Peyer's patches. Mr. Gunn cultivated a drop of blood in gelatinised chicken broth and obtained no *Bacillus anthracis*, but a crop of minute bacilli and numerous small micrococcoid bodies which he believed to be spores. He does not appear to have observed the presence of any spirilloid organisms in the blood.

A difference in opinion prevailed among the veterinary authorities as to the nature of the disease, some agreeing with Mr. Gunn as to the specific distinctness of the disease, others holding that "both in its course and *post-mortem* results it resembled ordinary Anthrax." Specimens of blood obtained from diseased animals were forwarded to Dr. Barclay for examination, with a view to aiding a decision of the question, and some of these were sent on by him to me. The first samples which reached me consisted of two capillary tubes containing blood and closed at either end with common sealing-wax. The tubes were first carefully washed with a solution of corrosive sublimate and with spirit, and were then allowed to dry. The tip of one of them was broken off by means of a freshly heated pair of forceps and the minute clot and serum introduced into a little freshly sterilised salt solution of a strength of 0·75 per cent. A portion of the clot was used for preparations, and the rest of it was broken up in the solution and used to inoculate a plate-culture of agar-agar peptonised meat-juice. The contents of the second tube were used for preparations. The preparations showed the presence of a few small straight bacilli and micrococci, and in one instance numerous large spirilloid bodies at a particular part of the clot. The cultivation yielded a few colonies of straight bacilli of considerable size, and innumerable colonies of *Micrococcus luteus*. Subcutaneous injection of a solution full of the straight bacilli into the bodies of guinea-pigs produced no appreciable result.

The second set of samples consisted of four of the common microscopical glass slides, with a central hollow on one surface. The hollows contained blood, and were covered by cover-glasses. The contents were used for plate-cultures and preparations. In one specimen the clot was full of small straight bacilli, in the others the characters agreed generally with those of the previous samples, but in none of them could any spirilloid bodies be detected. The results of cultivations were similar to those of the cultivation from the first sample, and in no case was there any evidence of the presence of *Bacillus anthracis*.

The spirilloid organisms in one of the first set of preparations presented the following characters. They were present in large numbers in the thin stratum of blood along a portion of the edge of a thick mass of clot, among the blood corpuscles which had been pressed out of it in the course of preparation. They consisted of filaments of various lengths, some merely curved or sinuous, others, and specially the longer ones, showing one or two distinct spirals. Both extremities appeared to be pointed, but one was apparently thicker and somewhat blunter than the other. In some cases a slender flagellar process could be recognised, continued for some distance from the more pointed extremity. The length of the larger specimens, omitting the curves, was about 25 μ, the breadth varying in different parts of the thicker portions of the body from 1·5 μ to 0·78 μ. The filaments were sometimes only very slightly curved, but were in no instances straight. They were always quite smooth in outline, and showed no granularity of texture. In one specimen a pale vacuole-like area was present in the middle of the length of the filament. There can, I think, be little doubt that these bodies are identical with

those described by Drs. Evans and Steel. The fact that only mounted specimens came under observation rendered it impossible to ascertain the character of their behaviour in the blood, but their general structural features agree very closely with those described by Drs. Evans and Steel as present in their specimens, and as Dr. Lewis pointed out in regard to the latter, are almost identical with those of the organisms discovered by him in the blood of rats. The measurements given by Dr. Lewis of the organisms in the rats' blood are 25 μ by 0·8 μ to 1 μ, practically identical with those of the larger filaments in the present instance.

The above facts clearly go to show one thing—namely, that the term Anthrax has been used very loosely as a descriptive term for various forms of disease in horses in India, and that some of these are certainly not specific Anthrax, dependent on the invasion of the system by *Bacillus anthracis*. It is only now, when systematic thermometrical observations are carried out and cultivations of the blood are conducted, that this begins to be appreciable, and it certainly is very desirable that the matter should be thoroughly investigated and trustworthy information obtained to what extent true Anthrax really does occur. It certainly is remarkable that with such extremely common occurrence of so-called Anthrax in horses so little is heard of the disease in cattle.

It also appears that in certain forms of equine disease peculiar spirilloid organisms occur in large numbers in the blood, and that the disease has occurred in healthy animals subsequent to inoculation of such blood, but this is all which has been as yet demonstrated. The statement that the disease is closely related to human relapsing fever is certainly not supported by the thermometrical data, and the truly spirillar nature of the parasitic bodies has yet to be demonstrated. Even were this conclusively done, there would still remain an absence of evidence to show that they are casually related to the disease. There is apparently as yet no evidence that it has been definitely ascertained that such organisms are never present in horses in health, as they were in the case of the dog into which they were introduced by inoculation, and as, at all events, similar organisms have been shown by Dr. Lewis to occur in the blood of healthy rats. It has further to be shown that they are invariably present in cases of the disease. In so far as thermometrical data go, the disease observed by Mr. Gunn at Meerut appears to have been identical with that studied by Mr. Steel in Burma, and yet the presence of such organisms in the blood was not apparently observed, and in so far as my own observations go was not constant. This may, no doubt, possibly be due to the specimens of blood having been taken at times when the organisms were absent or present in very small numbers in the general circulation, as it is recorded that their appearance is of an intermittent character, and as regards the samples examined by me may possibly have been connected with the length of time elapsing between the period at which they were taken and that at which they came into my possession. The facts are, however, at least such as to render it additionally necessary that definite evidence should be forthcoming to show the constant association of the disease with the presence of the parasites. The fact of the occurrence of the disease in previously healthy animals and the appearance of the parasite in their blood after inoculation do not afford data of any conclusive value. They certainly show that the parasites can be transferred from the body of one animal to that of another, but that is all. There is nothing to show that they gave rise to the associated disease. No clean artificial cultivations have as yet been carried out, and all inoculations have been conducted by means of blood directly transferred from the diseased to the healthy animal; so that, fully granting that the disease has been shown to be inoculable and that the parasites are similarly transferable, there is yet nothing to show that the

two phenomena hold any beyond a parallel relation to one another; there is nothing to show that the transplantation of the parasites was the cause of the development of the disease in the inoculated animals. Whilst, on the one hand, there is this entire absence of positive evidence of the pathogenic function of the parasites, there is, on the other hand, some evidence pointing in an opposite direction—evidence which is, at all events, calculated to raise additional doubts as to their essential relation to the disease. This lies in Dr. Lewis's observations, which have been already referred to, on the persistent intermittent occurrence of large numbers of the organisms in the blood of a dog long after inoculation and quite apart from the presence of any morbid symptoms.

GESTATION IN MARES.

An extensive horse-breeder in Oregon, U.S.A., has been making some interesting observations on the duration of pregnancy in mares, as influenced by the season. He writes, "On the 20th of July, 1879, I bred a mare, and she foaled on the 30th of the following May. The next spring I bred my mares early, and they carried their foals about eleven and a half months. The thought occurred to me then that mares bred early in spring carried their foals longer than those bred later. For the next two seasons I took charge of a band of mares, and found that those bred in April carried their foals longer than those bred in May, and that those bred in May went longer than those bred in June and July. Since then I have had considerable bad luck with my mares getting with foal on the range by scrub horses, and have only kept the time of those that I was certain of as to time of breeding. The average number of days of gestation for nineteen mares bred in April is 348 days; average for twenty-three mares bred in May is 345 days; average for thirteen mares bred in June and July is 338 days; longest time of any mare bred in April is 360 days; shortest time of any mare bred in April is 332 days; longest time of any mare bred in May is 360 days; shortest time of any mare bred in May is 323 days; longest time of any mare bred in June and July is 354 days; shortest time of any mare bred in June and July is 314 days. The last mare referred to was a virgin mare, and very fat at the time of breeding, and continued so up to the time of foaling. Mares here in Oregon usually get very poor during the winter months, but have an abundance of nutritious grass to run on during the spring and summer months. It is my opinion that mares that have an abundance of nutritious food for a time previous to foaling bring the fœtus to maturity sooner than they would were they kept on a small amount of very innutritious food."

Proceedings of Veterinary Medical Societies, &c.

MIDLAND COUNTIES VETERINARY ASSOCIATION.

A quarterly meeting of this Association was held on Friday, August 17th, at the "Bell Hotel," Derby. Mr. J. M. Parker took the chair, in the absence (through indisposition) of Mr. R. C. Trigger, President of the Association. There were present—Captain Russell, Professor Pritchard, Coe, J. Aitken, Greaves, H. Olver, W. Carless, Rossell, Malcolm (Hon. Sec.), Messrs. Jones,

Hodgkinson, Wragg, Barling, Wartnaby, Barnes, J. G. Burchall, H. Stanley, and Mr. Briggs, of Bury.

Letters of apology were received from Sir H. Simpson, Professors Walley and Williams, Messrs. Taylor, Tailby, Over, and Carless.

The minutes of the last meeting were read and confirmed.

The SECRETARY said he had received a letter informing him that the President was unable to be present, through a severe attack of illness.

Captain RUSSELL moved that a telegram of sympathy be forwarded to the President, expressing the hope that he would soon be convalescent. This proposal was at once acted upon, and before the termination of the meeting a reply was received from Mr. Trigger, returning his thanks, saying he was slowly improving, and hoping the meeting would be a pleasant and instructive one.

Mr. George Wartnaby and Mr. T. Duckworth were elected members of the Association.

The SECRETARY then read a letter which the President had sent to the Members of Parliament in the district embraced by the Association. It stated that Sir Frederick Fitzwygram, M.P., had, in conversation with the Chancellor of the Exchequer, obtained a promise to give veterinary surgeons in actual practice the same exemption from payment of the horse-tax as it is proposed under the Excise Duties' Bill to give to clergymen and medical men, if an amendment to that effect were approved of by the House. It then solicited the support of all the local Members when Sir Frederick's amendment came before the House.

Captain RUSSELL moved a resolution, expressing the satisfaction with which they had heard of Sir Frederick Fitzwygram's action, and tendering him the thanks of the meeting. He took it that no one in the room could afford to keep a horse for mere pleasure, and he held, both in his capacity as a magistrate and as a veterinary surgeon, that an active practitioner should be exempt from the tax.

Mr. OLVER said he had communicated with three or four Members of Parliament, and secured their support for the hon. Baronet's resolution. He claimed exemption, as being a branch of the medical profession. He thoroughly agreed with Captain Russell's resolution, and would be happy to second it, so that the hands of Sir Frederick Fitzwygram might be strengthened.

The motion was passed, and a copy ordered to be forwarded to Sir Frederick.

OPERATION FOR ROARING.

Captain RUSSELL gave a short account of an operation performed by Mr. Fred Smith, at Newcastle-upon-Tyne, upon two horses, with the view of curing them of Roaring.

Mr. JONES said he had performed operations on a dozen horses, but there was not a sufficient lapse of time yet to say whether they would be successful. All the operations he had performed by introducing his own tracheotomy tube into the trachea, the tube itself being in diameter fifteen-sixteenths of an inch inside, had been most successful.

Professor PRITCHARD said the object of Dr. Fleming was undoubtedly to relieve a roaring horse, but confessed his inability to understand how this operation would bring about the desired result. If he had correctly gathered the theory expressed at the First Avenue Hotel a few nights previously, the operation would most unmistakably fail. The theory he held—and it would take a great deal to disabuse his mind of it—was that the vocal chord had nothing to do with Roaring, and until he was satisfied that it could be brought into a relaxed condition he should have very strong doubts that the

operation would succeed. He thought it was a mistake to attempt to remove the arytenoid cartilage, because by doing so they were rendering the animal liable to choke.

Mr. JONES: I consider the tissue white fibrous in the vocal chord.

Professor PRITCHARD: If it were white fibrous tissue you would have no voice or sound. It is upon that the voice depends, and upon the control of the muscles over the chordæ vocalis our great singers are enabled to produce high and low notes.

Captain RUSSELL: I am compelled to agree with Professor Pritchard, for I have rendered my unfortunate animal dumb by removing both vocal chords.

Mr. GREAVES advocated for the operation a fair trial before condemning it. Hitherto Roaring had never been cured.

The discussion then terminated.

Mr. WM. HUNTING then read a paper

ON SURGICAL SHOEING.

After some general remarks on shoeing and the necessity of practical acquaintance with the art, the essayist said he proposed to consider his subject in two divisions—first, as adopted for certain conditions of the leg; second, as adopted for conditions in the foot. He next referred to the practice in some towns of applying high-heeled shoes to horses lame from any cause, upon the theory, he presumed, that such a shoe assisted to rest the leg. He considered such a practice purely empirical and oftentimes injurious. Any alteration of a shoe from the level should only be adopted with a definite object and a distinct understanding of its effect. He then proceeded to consider some of the various effects upon the limb we might wish to obtain, as follows:—

TO EXTEND OR FLEX SOME JOINTS.

This indication looks a little vague, and the question naturally arises, What joints? In answer I submit that it is nearly impossible to alter the relative proportions between the back and front of a horse's foot without affecting the limb above. When any raising or lowering of the heel, any shortening or lengthening of toe does affect the leg, it must directly affect every joint up to the knee and hock, and any limitation or excess of movement in these two large joints must indirectly affect every other joint of the leg.

Practically, the fetlock and knee or fetlock and hock are the joints which we attempt to react on by altering the form of the shoe.

The methods adopted to flex or extend the joints are two—raising the heel of the shoe limits the extension and facilitates flexion; lengthening the toe of a shoe promotes extension and limits flexion. To a certain extent these ends could be attained by altering the relative proportions of the hoof. We could leave the wall at the toe long, or we could shorten it whilst allowing the heels to grow down. The objection to this plan is that as soon as you retain any single part of the hoof of a disproportionate size you do harm to some other part. Overgrown heels soon cause a wasted frog; an overgrown toe means a weak wall, because it loses the support of the sole, which is unable to retain its integrity, as does the horn of the wall, when growth is disproportioned to wear. It is advisable, then, in any attempts to alter the relative positions of foot and limb, not to interfere with the natural proportions of the foot, but to make the alteration in the shoe.

In the case of Bent Knees, unaccompanied by any acute disease, we have a condition where extension—perhaps I ought to say forcible or excessive extension—of the joint is indicated. We attempt this by elongating the toe of the shoe, so that at each step greater extension of the knee is required to

overcome the resistance of the toe in rotating upon the ground. The result is that at each extension the contracted ligaments and tendons are stretched, and gradually the bones are brought back to their proper position.

In cases of Sprained Tendon or Ligament our object is just the opposite. We wish to limit extension of the bones upon each other, and therefore we alter our shoe so as to prevent over-extension. We raise the heels of the shoe, and thus relax the ligaments and tendons. In cases of Spavin it is said that a good effect follows the use of a high-heeled shoe, and it seems feasible, because the raising of the heel must prevent over-extension of the joint when the foot is on the ground during progression. In this case, however, we have one disadvantage, in that a spavined horse always wears hard on the toe, and we all know that the higher the heels of a shoe the more quickly the toe is worn. This disadvantage is met by another alteration of the shoe; viz., turning up the toe out of wear, or as it is commonly called, rolling the toe. This is rendered most effective when the toe of the hoof is first rather over-reduced, and the shoe fitted to it with a curved adjusture.

TO FIX THE LIMB.

Splints on a horse's leg have to be very strong and very firmly attached to be secure. This often leads to abrasions of the skin. If the case be one in which it is practicable to remove the shoe a very firm splint can be applied, having its lower attachment to the shoe. A long bar-shoe is made, and the bar cranked upwards. Through this a hole is punched, and the end of the splint being passed through the hole, is secured by a nut. For fractures, of course, this is an impracticable arrangement, but for open joints or other conditions where the movement of a joint must be prevented it is very useful. I have used it with good effects in fixing a knee which was badly cut, and when movement interfered with the healing process.

TO MODIFY DEFECTS IN ACTION.

There are only two conditions I wish to notice under this head—one in which the horse "goes on his heels," the other in which he "goes on his toes." The result is excessive wear of the shoe at those parts. To meet this we often see the shoe thickened at the spot. In these cases I find that the horse always goes best when the shoes have been on some time, and worst just after being shod. When an engineer finds excessive wear at some part of his machine he does not thicken that part; on the contrary, he follows the indication that there is something superfluous there—something in the way—and he removes it. We also should, I think, follow the indication of the horse, and instead of forcing the part into greater attrition, do the opposite—*i.e.*, remove it from wear as much as possible. If it be the toe, shorten the toe of the foot, and turn up the toe of the shoe, following as near as possible the line or curve of wear shown by the old shoe. If it be the heel, lower the heel of the foot, lengthen the heel of the shoe, and curve it slightly upwards in imitation of the form of the old shoe produced by wear.

The same principle applies when wear is excessive upon either the outside or inside branch of a shoe—lower the wall on the worn side.

TO PREVENT INJURY WHILST STANDING OR LYING.

Capped elbow I have always considered due to a bruise by the heel of the shoe whilst lying down. Recently I have been a little shaken in this opinion by seeing a large stud of horses, apparently well shod, suffering to the extent of about 30 per cent. from capped elbows. The veterinary surgeon in attendance has convinced himself that the shoeing is not the cause, and that it

is the result of bruising by injury on the floor, either in rising or lying down. He does not deny that the shoe irritates an enlarged elbow, or even that it may make it worse when once it has happened. One of his arguments seems to me to have some force; viz., that capped elbow nearly always first appears suddenly, whereas we should expect it to arise gradually if the repeated pressure of the shoe were the only exciting cause.

I am not much a believer in shortening the heels of a shoe to relieve a capped elbow, unless the heel be excessively long. I find even the heel of the foot will cause irritation, and I trust to a thick circular pad around the pastern.

TO PREVENT INJURY OR ANNOYANCE WHILST MOVING.

Under this head I include all the alterations of shoes adopted to prevent "clacking," "over-reaching," "cutting," and "speedy-cutting."

I never knew the blow of a hind shoe against the fore, which gives rise to that most irritating sound called "clacking," to do any harm to the horse. It is seldom produced by an old horse or one in condition. Tired horses, green horses, and especially those with a rolling, "slomicky" gait do it. I fancy, too, that the driver and the bit are sometimes to blame. The front shoe is struck on the inner circumference of the toe by the toe of the hind shoe. This can only be done when the fore-foot is in such a position that the clip is pointing to the ground and the shoe presenting its wearing surface at right angles to the ground. The alteration required is to make the front shoe concave on the ground surface, and to fit the hind shoe with its toe well back. In some cases the horn at the toe of the hind foot may be left projecting in front of the shoe. I always advise, too, that the hind shoes be level—no calkins.

Overreaching only occurs at the gallop, and in my experience never if the hind shoe be rounded on its inner circumference. Such a shoe is easily made in a "cress," or any shoe may be altered to the desired form by cutting away the iron of the inner circumference at the toe by means of a fuller, and then filing it up.

Speedy-cutting occurs at the trot but seldom, unless a horse is overpaced. Its prevention is more a matter of condition in the horse than an injury due to shoeing. No alteration of shoe will stop a horse from "dishing," but even animals with the most defective action will cease to "speedy-cut" when they get into hard condition. I have found the use of a three-quarter shoe to be accompanied by no return of the injury.

Cutting.—The most common injury to the legs for which we are called upon to alter the shoe is decidedly "cutting." All farriers and nearly all veterinary surgeons fancy they are specially gifted in devising plans to cure this evil. That the injury is done with the inside toe of the opposite foot is certain. At first sight, then, it seems logical to say, "Cut away the inside toe of that foot—both shoe and hoof—and the injury will cease." Unfortunately, it is common to see a horse in which this has been done to the greatest extreme still hitting the fetlock with the remains of the opposite hoof. We may safely say, then, that cutting is not merely due to a prominent shoe or a prominent hoof. It is not seen more in big-footed than small-footed horses. It is not even dependent on the weight of shoe, and we all have seen horses at daily work with coarse, full-fitted shoes that never "cut." Every young horse "cuts" when first put to work; horses that are weak or tired cut. Long-legged horses are more liable to cut than short-legged ones.

Half a dozen different farriers have half a dozen different ways of stopping "cutting," and all can produce instances of successes after one or more of their neighbours have failed to stop it. Did any man ever see a horse in good hard condition that had been at work a year "cut" his legs unless under

some exceptional circumstances, such as an extra long journey, which gives rise to leg weariness, or a change of climate, which often produces lassitude? I do not expect to gain much support for my opinion, but I ask you to discuss it thoroughly and logically; it is this, that horses only "cut" when from illness, weakness, want of condition, or other circumstances they are unable to perfectly control the action of their limbs; that shoeing has nothing whatever to do with it; that the fact of a horse ceasing to cut after a change of shoes is simply a coincidence; that the statement that "some horses require one sort of alteration and some another, depending upon their action," is a gratuitous assumption, and directly opposed to our daily experience.

TO PREVENT CONCUSSION.

Horses do sometimes jar their limbs even to the extent of splitting a bone or spraining a muscle or ligament, but these accidents are always the result of a false step—*i.e.*, of a movement of the leg over which from some cause the regular co-ordination has become interrupted. When a horse makes a slip on some smooth surface he loses control of his action, and weight is applied to some structure—bone, muscle, or ligament—which at the time is in a position or condition unprepared for it. The consequence is injury. When a horse that has been some days in the stable comes out with more excitement and courage than sense he is liable to jar some structure, because his movements are not deliberate and controlled. Again, when a horse puts his foot on a surface differing in level from that surrounding it he suffers from concussion. Those of us who have walked over an unnoticed step, or who, coming down a stair, fancy they have reached the bottom when there is one more step, know quite well how concussion occurs, when the muscles of the leg and the position of the bones are not adapted to the level upon which the foot must rest.

All concussion of the limb that I know of is dependent upon the position of the bones and the action of the muscles. It cannot possibly be affected by the form of shoe or by anything applied to the foot, unless it be something which does harm by altering the proper relative position of the foot to the leg.

IN RELATION TO THE FOOT.

Surgical shoeing in relation to the foot is a subject for a volume, but as my object is not to be exhaustive, but only suggestive, I enter upon it with strong hopes that I shall not be wearisome.

Having just referred to concussion as it affects the leg of the horse, it may be convenient at once to say what I think about this cause of injury as it affects the foot.

The popular idea of concussion—that it is the inevitable result of "the 'ammer, 'ammer, 'ammer on the 'ard 'igh road," is not mine. I do not believe that hardness, *per se*, is an objectionable quality in roads. I do not believe that a soft road is any better than a hard one for a healthy horse's foot, and I am sure it is much worse for his muscles. I may be told that horses wear out more rapidly when worked on hard roads, and that their feet are the first part to show the result of work. I do not dispute the fact at all. I merely deny that it is due to the quality of road. I say it is the excessive work and bad shoeing to which they are subject that destroys them—that wears out fifty per cent. of horses before they reach maturity, and shortens the working life of all horses by three or four years.

Nature has provided in the foot and leg against all direct concussion. The foot has its hard tough wall and sole as its chief protection, then its elastic horny frog and the soft frog-pad, with the lateral cartilages and the obliquity of the pastern to still further guard against concussion. So long as these

maintain their integrity there is no jar. When, however, some disease or injury happens, then the foot is easily jarred. No part of the body suffers more acutely from any change of a painful nature, and therefore it is often necessary to guard against concussion when no very definite signs of disease are visible, but when the change of action indicates to the scientific observer that pain exists. I have no doubt whatever that the foot of the horse suffers all the little disturbances that affect the human nail, as well as the greater changes that even a novice cannot overlook. The milder degrees of pain accompanying the slighter changes are made evident by no sign, except defective action, and that varies in degree from "not going as free as usual" to "going decidedly short." Such is my explanation of what are called cases due to concussion. Not until disease exist does concussion apply. To prevent it we can do nothing which is not superfluous in a sound foot, but to modify it we may use indiarubber pads, or the steel-spring shoe on feet already injured. There are a number of definite conditions affecting the foot in which surgical shoeing is demanded, and I think only two principles are concerned in all—we either have to protect a part by covering it up, or relieve it from pressure by preventing contact with the shoe.

PROTECTION BY THE SHOE

is only necessary when the horny covering of a part is removed. When the sole has been punctured and horn has been removed to allow examination and treatment of the wound, then protection is necessary, and none is better than tow and tar retained by splints. In cases where it may not be necessary to occasionally remove the covering from the part, then leather attached with the shoe is best. Under no circumstances that I know of is it necessary to make the shoe wide, simply as a protection. Width as expressed by "plenty of cover" in a shoe is at no time necessary or expedient.

"Convex soles" are liable to injury by rough stones, and may require protection. This is best afforded by a leather sole, but as soon as sufficient thickness of horn has been allowed to grow, I think a shoe is more easily and exactly fitted without any leather. In these cases I do not believe in the protection afforded by a wide-webbed shoe. It is necessary to make the shoe of sufficient thickness to prevent direct contact between the sole and ground at each step, and a very narrow shoe, though it will do this, is not easily fitted or holed for nails. A medium width of shoe is best, and it must be carefully seated, so as not to cause any uneven pressure on the sole. It must also have a good bearing surface, so that weight, through the wall, rests evenly upon it. Very often we see shoes, for such feet, seated from the outer edge to the inner, so that the foot surface of the shoe presents an incline downwards to the centre—exactly like a saucer. Now, a shoe of this kind is an unmitigated evil, as the weight of the horse forces the foot down this incline, and pressure, or perhaps I should say compression, of the whole foot is the consequence.

RELIEF OF PRESSURE.

When some limited portion of the hoof is diseased or injured it is requisite to remove it from pressure by the shoe. In ordinary cases of broken hoof we have the simplest condition of this kind. As the result of a lost shoe we may have the horn at the quarters or toe broken away, so that any pressure on the part causes pain. The indication is to utilise those parts of the hoof that are soundest, and place upon them the extra bearing. In most cases I find that the heels are least injured, and if they will allow a stroke or two of the rasp their bearing surface is lengthened, and thus weight most judiciously distributed.

"SEEDY TOE"

requires no pressure on the affected part.

After a shoe is properly fitted—not attached—it will be easily seen what parts of the wall are to be eased. I make a practice of then cutting away about a third of an inch of the lower edge of the wall, so that a considerable space is left between the shoe and it. As the hoof grows it will be found that this space soon becomes less, and in a few weeks has disappeared. This is proof of a peculiar physiological fact—viz., that any portion of wall not having the same bearing as another grows faster, and consequently the time soon arrives when it takes a bearing on the shoe. This explains why it is not at all uncommon to have lameness recur if the removal of shoes be too long postponed. In "seedy toe," in fact in all conditions where the front part of the foot is tender, it is necessary to avoid raising the heels, as this throws weight forward and may cause lameness. In such cases, then, avoid calkins.

"SAND-CRACK"

When at the toe requires that the wall should not be in contact with the shoe on either side of the crack for at least an inch. We must, also, not put a clip over it, but we should have one at each side (not too close). We also remove the calkins of shoes and lower the heels. When the crack is at the quarter I have seen care taken not to have any bearing of the horn behind it upon the shoe. I think this is opposed to all reason. We know that the wall of the heels is sufficiently yielding to bend downwards when the weight of the horse is placed upon it. If you leave a space between the heel and the shoe for an inch and a half—a space into which you can place a small penholder—you will find that contact with the ground results in the horn being pressed down until it touches the shoe. Now, if we have a crack in the quarters every such movement tends to drag it open. The indication, to my mind, is to so fit a shoe as to prevent this up and down motion, to take a level bearing from toe to heel, but, before nailing the shoe on, to rasp away the lower edge of the wall at the sand-crack and for an inch each side of it.

Corns are simply bruises to the angle of the sensitive sole, caused by the heel of the shoe. By repeated bruising we have exostoses on the extreme angle of the coffin-bone, and hypertrophy of the soft tissues covering it. This condition is very easily irritated, and hence the saying, "Once a corn always a corn." It is not true. If a corn be at first properly treated, and time allowed, there is no liability to its recurrence. A good shoe for a corn is a three-quarter shoe. By it pressure is absolutely removed, and even the worst farrier can effect the alteration. Why it should be considered expedient to cut away the horn of a horse's foot when a little staining at the heel is found I do not know. We ought to be able, in most cases, to diagnose the existence of suppuration without seeing it. Of course if matter exist it is right to allow it to escape; but half the corns, even when lameness exists, have not reached the stage of suppuration, and if the pressure be relieved, never will. Cutting away all the horn at the heel, as is done by explorers for corns, leaves the wall without its proper internal support. The horny wall requisite for bearing becomes a narrow ridge, and when weight is placed upon it is forced either inwards or outwards, either movement causing pain and injuring the already inflamed structures within.

CONTRACTED FEET.

The surgical shoeing necessary for contracted feet is simply negative. You can do a lot of good by letting them alone. By using tips the hoof is protected from wear, and the back parts of the foot allowed free play. The

extra bearing on the heels and frogs increases their functional activity and promotes their development.

Some care is requisite in using tips not to destroy the proper relative proportions of the foot. If retained too long, the toe grows excessively long, and harm results. Tips, like shoes, should never be allowed to remain on horses' feet over a month. Quite as much harm may be done by allowing a horse's foot to become disproportionate from overgrowth as by too-frequent changes of shoes and ignorant removal of horn.

It has been attempted to mechanically force the expansion of a horse's foot by so fitting the shoe that the heels rested upon an inclined plane—not by the "saucer" shoe I referred to, but by a shoe exactly the opposite, the bearing surface being inclined outwards. This shoe certainly forced the heels apart, and—it lamed the horse. In horse-shoeing, as in other matters, main strength and stupidity are bad substitutes for patience and brains.

THE DISCUSSION.

Mr. GREAVES said the paper did not lack practical intelligence; it was brimful of common sense. On some points he did not agree with Mr. Hunting; this remark applied to the assertion that cutting was not due to shoeing. He could show Mr. Hunting numbers of horses that cut badly with one sort of shoe, and never cut at all with another sort. His experience had forced upon him the conviction that there was a good deal in shoeing. He had a number of horses at work in Manchester with patten shoes; in nearly every case they were horses with contracted tendons. And he had known a horse stand still and refuse to move when the shoe broke. Certain circumstances required one to be shod with thick toes and thin heels, and others with thin toes and thick heels. He urged the importance of preparing the foot in the process of shoeing, and leaving nature to pare the soles. Horses now soon recovered from pricking, from the fact that smooth clean nails were used.

Professor PRITCHARD paid a high compliment to the essayist on the quality of his paper. He fully agreed with Mr. Hunting's view, that it was not necessary for a V.S. to have a shoeing-forge. In many cases if a V.S. could do without one, if he would take his advice, he would never have one. He went on to speak of the value of a practical knowledge of the art of shoeing, which afforded an insight impossible to obtain otherwise. Although he agreed with a great portion of what Mr. Hunting had said, he disagreed with reference to capped elbows. It was impossible, he believed, to produce it by contact with the ground. He had taken a great deal of interest in this subject, and had come to the conclusion that either the inner heel of the shoe or the hard horn at that part of the foot was the cause in a very large proportion, if not in all cases, of capped elbows. That capped elbow might be increased by coming in contact with the ground he would agree, but in the first instance it was produced by an injury from the inner portion of the heel. He believed that some horses in whatever condition they were would cut their legs. He had a mare who would cut unless shod in the way he had laid down to the shoeing-smith. There was another mode of cutting he would call "overreach," which the essayist had not mentioned. That was cutting the elbows with the toe of the shoe. He had seen cases where horses would go better in shoes with what he might call a good deal of cover than without it. In cases of Laminitis he could fancy a broad shoe might be used with advantage. He was of opinion, however, that exercise and the broad shoe were most likely to be of real use if the disease were not in an advanced stage. Replying to Mr. Greaves, he knew of one instance where the pedal-bone was restored to its original position, and he had seen cases where the toe and the pedal-bone had descended considerably, and been got

back to nearly its original position, but the descent had not resulted from Laminitis.

Mr. GREAVES said he had always held strongly to the opinion that when a coffin had once descended it could not regain its position, but when he had been shown a horse which was sound, after suffering from Laminitis, and in which he was assured the coffin-bone had been seen through the sole, he changed his mind. In his own experience he had never seen a perfect recovery.

Mr. OLVER said he could call to mind cases where, irrespective of condition, horses cut with one class of shoe, and not with another. He could not agree with the essayist that only in cases of disease did concussion apply, and in support of this view he mentioned the case of a hunter of his own, which, after a high jump, had become lame, and would never, he feared, be sound again, simply, he believed, from concussion. He thoroughly condemned the practice of using calkins and toe-pieces.

Mr. STANLEY advocated the use of indiarubber pads where necessary, and expressed the belief that quite half the horses had to be specially shod against cutting, and would continue to cut, no matter what their condition, unless so shod.

Captain RUSSELL gave instances of stallions that had been perfectly cured of Laminitis, and thought that if the foot was got at before the bastard horn was set it might be rendered sound. He was not so sure if it got into a chronic hard condition that any good could be done with it. In canker he had found benefit from a flat shoe fitted with a movable iron plate. He used a rivet for Sand-crack in preference to any other method. He believed a good deal of cutting was caused by the early breaking-in of horses.

Mr. CARLESS said his experience went to show that cutting was often caused by the faulty adaptation of the first shoe, and it was most difficult to stop after it had begun. Shoeing with high heels he held to be most objectionable.

Mr. BRIGGS observed that, in his opinion, weight in a shoe was of some value—it prevented concussion. He instanced the Irish shoes, and said horses brought over from Ireland with heavy, clumsy shoes never went so well after they had been shod in England. Cutting, he believed, was due sometimes to shoeing. He deprecated the use in towns of leathers, which interfered with the firm fixing of the shoes, although he agreed that leather might be a protection on country roads.

Mr. HUNTING briefly replied. He regarded it as somewhat satisfactory to find he was not so singular as he fancied. He thought he differed very considerably from many, both with regard to healthy and surgical shoeing, but he found there was exceedingly little real difference between them. On the subject of cutting he purposely put it as strongly as possible, with the view of evoking discussion. It seemed to be generally acknowledged that condition had a great deal to do with cutting. There was no special principle whereby they stopped a horse from cutting. Twenty years ago the veterinary profession had no knowledge of shoeing; now, he was happy to say, it was otherwise, to the advantage both of the owner and the horses themselves.

On the motion of Professor PRITCHARD, seconded by Mr. GREAVES, hearty thanks were accorded to Mr. Hunting for his paper.

The next meeting was fixed to be held at Worcester.

The Chairman was cordially thanked for his services, and the company adjourned to dinner.

NATIONAL VETERINARY ASSOCIATION.

(*Continued from page* 225.)

In his paper on "Some Diseases of the Foot of the Horse," Professor SMITH described Navicular disease (Laminitis) and his operation for ossified cartilages, already fully alluded to by him in this Journal.

In opening the discussion, Mr. HUNTER dealt with some of the points in the physiology of the foot in the relations to Navicular disease; and with regard to the latter he was of opinion that concussion was the chief cause. He had successfully operated on horses, the operation being that known as the high one. He hoped Mr. Smith's operation for Laminitis would prove of service, and thought the incisions in the hoof would be better made with a knife than a saw, as they could see better how they should be cut. With regard to side-bones, he imagined the essayist's operation was the most likely and best means of relieving the horse, but it should not be practised until the side-bone was sufficiently formed.

Mr. MCGAVIN thought a great cause of Navicular disease was standing idle in the stable, and if horses were kept in loose-boxes and moderately fed, it would not occur. Concussion was not a principal cause. Neurotomy he approved of, and preferred the high operation. Overfeeding was a frequent cause of Laminitis, and then purgatives were useful, as well as exercise on a soft bed, with lowered heels and broad shoes, followed by blistering. For side-bones he was in favour of Mr. Smith's operation.

Mr. RUTHERFORD disputed Mr. Smith's views as to the expansion of the horse's foot. Navicular disease was mainly hereditary, and chiefly affected Western horses. In Laminitis, effusion chiefly occurred at the front of the foot, between the hoof and pedal bone, which became displaced through movement. He had obtained good results by Mr. Smith's operation for side-bone.

Mr. HUNTING said Mr. Smith's paper was a most important one. The hoof did not contract, and he was not certain that it expanded.

Professor WALLEY believed there was some expansion in the foot. In many cases of Navicular disease, congestion of the vessels in the bone was due to the position of the latter and also maltreatment of the feet. Many cases of so-called Navicular disease were cases of Rheumatism, and concussion had nothing to do with its production. External injury might produce it. Rest, hot water fomentations and physic, was the treatment. Frog setons were of great value. For Laminitis, he put the horse on a soft place, or in a flooded loose-box. There was only congestion in the early stage of the disease; inflammation ensued after three or four days. He did not bleed at the toe.

Mr. HUNTER thought Navicular disease was due to fast and inconstant work; if pressure were the cause it would occur in heavy horses also.

Mr. EDGAR was of opinion that concussion was the chief cause of Navicular disease. He recommended Urquhart's pads.

Prof. PENBERTHY insisted on hereditary influence in the production of Navicular disease, and with regard to the high operation of Neurotomy he did not agree with Professor Smith.

Mr. ROBINSON desired, through the President, to make known that he recommended Mr. Smith's operation, and he (the President) agreed with the latter in preferring the low to the high operation. Setoning the frog was not cruelty. Some cases of indigestion might give rise to Laminitis. He gave a dose of physic.

Prof. SMITH was still of opinion that the weight of the body was supported by the perforans tendon, and that compression as a cause of

Navicular disease was a fact. In operating he preferred the low operation.

A vote of thanks was unanimously awarded Professor Smith.

VETERINARY EDUCATION AND REQUIREMENTS.

Mr. E. FAULKNER, M.R.C.V.S. (Manchester), in the course of a paper on "Veterinary Education and Requirements," said the profession, like all human institutions, was not perfect; but considering the difficulties with which it had been surrounded and embarrassed, the wonder was that without pecuniary aid from the State it should have advanced to its present position. The desire to still further improve and progress with the age and times, in order to become more serviceable, was now and must always be uppermost in the minds of all those who wished to see the profession a useful factor in the national well-being. To this end the careful consideration of such an important matter as veterinary education and requirements at the present time by a representative gathering of the profession could not be otherwise than beneficial to all interests concerned. The various veterinary requirements might be broadly stated as the requirements of the veterinary aspirant in order to become a qualified and competent veterinary surgeon; the requirements of the Royal College of Veterinary Surgeons; and that which is required by the public from the profession. In the first division, briefly, amongst the things needful, was the possession of a good general scientific and practical education, combined with thorough acquaintance and capability in the duties and details of professional practice. In the second division the Royal College of Veterinary Surgeons required from its graduates that they should, upon examination, prove themselves fully qualified to practice the art and science of veterinary surgery and medicine. In the third, to serve the public well, required that a veterinary surgeon should fulfil all the functions that appertain to his calling in a sound, practical manner, based on scientific principles and truths. Veterinary education divided itself naturally into the general and the professional. General education should, in his opinion, be such as tended to the development of the youth's physical and mental capabilities, and was best suited to the requirements of the profession he intended to adopt. Matters extraneous and foreign should not be crammed into his scholastic course, to the exclusion of that which was essential; rather should they perfect what would be of service, and exclude such as was not in his special case likely to be of benefit. Professional education required to be thoroughly systematised and applied to professional requirements in order to be efficient, and ought to include a complete training of eye, hand, and brain, development of close observation, and the faculty of reflection, and also the necessary manual skill. Having obtained the diploma of membership of the Royal College of Veterinary Surgeons, it was very essential that further experience should be gained in general practice as assistants, and on no account was it desirable to commence practice before attaining the age of twenty-five years. Referring to the requirements of the public, he said members of the veterinary profession required to be just what the diploma of the Royal College of Veterinary Surgeons said they were, in order that public interests be well served. According to the scientific and practical ability, skill, and attention brought to bear on each case under all kinds of circumstances and its utility, be it advising, operating, or prescribing, so would be the degree of esteem and confidence in which the profession would be held by the public.

Mr. WM. HUNTING (Newcastle) opened the discussion on the subject. He said first they should consider what the public required of them, and then they should try to supply the want, or nearly so. He favoured the employ-

ment of specialists as teachers. The pupil required brains, and then he had to work.

Mr. H. KIDD (Hungerford, Bucks) thought it would be an immense educational advantage to have a course of hygiene.

Professor Walley (Edinburgh), Mr. G. G. Mayor (Kirkham, near Preston), and Mr. J. B. Wolstenholme (Manchester) also spoke upon the subject.

Mr. FAULKNER, in responding, said he agreed with Mr. Hunting that there should be specialists as teachers; but he held that the specialists should come from within the profession, and not from without. As to higher education, he felt that progress must be slow in that direction.

This discussion was closed by a vote of thanks to Mr. Faulkner; and votes of thanks to the President, the Provincial Committee, and local and general secretaries, terminated the meeting.

BOMBAY VETERINARY COLLEGE.

THE following is the Government resolution on the annual report of the Bombay Veterinary College:—

Resolution.—In submitting his annual report upon the working of the Bombay Veterinary College for the year ending on the 31st of March last (to which is appended a copy of report made to the secretary of the Society for the Prevention of Cruelty to Animals concerning the operations conducted in the Bai Sakarbai Dinsha Petit Hospital for Animals for the calendar year 1887), Mr. Steel, the superintendent, deals with a large number of questions, several of which are under the separate consideration of Government, and do not therefore call for special remark in the present review, which will be confined to an examination of the results of the legitimate work of the college during the year.

2. Last year's report dealt with a period of eight months only, during which the institution had been open. The present, therefore, is the first report actually embracing the facts and figures of a full year. At its commencement the number of students attending the classes was sixty-four, while at its close it had risen to eighty. The first examination was held in April, 1887, at which forty-three candidates appeared for their first professional examination, of whom thirty-four were successful. No students were as yet qualified for appearance for the second or higher standard. A supplementary examination was, however, with the approval of Government, held in September, at which two hospital assistants from Central India were permitted as a special case to appear for the second examination, without having gone through the usual curriculum, whilst seventeen candidates presented themselves for the first examination. The two hospital assistants passed, as also did eight of the latter. There were, therefore, at the close of the year undergoing instruction two seniors who had passed the second examination; forty intermediates, who had passed only the first examination; and thirty-eight juniors, who had as yet appeared for none except that required on entrance. The practice of having supplementary examinations is open to serious objections, as pointed out by the superintendent, and should only be resorted to in cases of peculiar necessity, which are unlikely often to occur. The question of the appointment of a permanent Board of Examiners is under the separate consideration of Government, and orders thereupon will shortly be issued.

3. It is gratifying to learn that the progress made by the free Government and municipal students, as a rule, fully justifies their selection. Of these there are apparently fifteen, as shown in Appendix B to the report, a figure which does not, however, tally with the details in Appendix A, in which sixteen such

students are entered. The tendency of the Native States of the presidency to avail themselves of the education given at the college is worthy of notice. There are in the institution twenty-one students sent from foreign territory, the chiefs of Sangli, Bhownugger, and Gondal having to be added this year to the list of those who have taken action in the matter. Appendix A shows one student as "Private free," a classification which is not understood, unless it refers to holder of the "*Steel Free* Studentship" mentioned in paragraph 20 of the report.

4. Mr. Steel suggests in paragraph 8 of his report that an instalment of the first half-year's fees might be required from each candidate for the entrance examination, by way of fine upon such as appear without any intention of pursuing their studies after passing. Government would be glad to receive the opinion of the college committee on this proposal.

5. The resignation of the Farrier-Major at the commencement of the year and the delay in the appointment of his successor have been unfortunate, though unavoidable. The question of the means of supplying a suitable man to fill the post is now under consideration, and meanwhile a native farrier is employed as a temporary measure.

6. His Excellency the Governor in Council trusts that the decrease in the attendance of the committee at their meetings is not caused by any falling off in interest in the management of the important institution under their control. No doubt, their work in organisation has been mainly accomplished, and much work of a purely routine nature can easily be managed by the circulation of papers; but the advantages which must result from the personal intercourse of the members of the committee for the discussion of points connected with the welfare of the college are so obvious that Government trust that it may be found feasible to hold a greater number of meetings in future years.

7. During the year a practical examination shed was constructed, and a commencement made of a chemical laboratory; the equipment of the dissecting-room and forge has been considerably improved, while numerous additions have been made to the museum and library. The grounds around the buildings have also been put in better order, and designs for quarters for resident students have been drawn up and submitted to Government.

8. Mr. Steel touches in his 18th paragraph upon "the measures best calculated to secure employment for the veterinary graduates." The subject is a large one, and cannot be satisfactorily dealt with in an annual report. It is, moreover, already under consideration, and comment thereupon may be conveniently postponed until the question is ripe for disposal.

9. The duties connected with the repression of cattle disease were again during the year carried on from the college, and visits of inspection were paid by Mr. Steel, his assistants, and in one case by two students, to Ratnagherry, Broach, Bijapur, Ahmedabad, the Panch Mahals, and Sholapur. The results are said to have been satisfactory; but as they have been made the subject of special report to Government, and are under consideration in connection with the whole question of the prevention of disease among cattle, it is unnecessary to allude further to them in this place.

10. Conformably with the wishes of Government, expressed in their resolution reviewing his report last year, Mr. Steel has submitted a statement of account (Appendix E), giving the receipts and expenditure (excluding building charges and examiners' fees) for the past year. The former are put down at Rs. 5,130 (Rs. 2,630 from fees, and Rs. 2,500 from the municipal grant), and the latter at Rs. 20,277. It does not appear, however, upon what grounds the grade pay of the two assistant surgeons, lent to the college as lecturers, which amounts to Rs. 3,000 per annum, has been omitted from the debit side of the account. Nor is it clear whether the fees credited were all

recovered within the financial year. The financial statement has, indeed, not been prepared with sufficient clearness, and the committee should be asked to prescribe a form of balance-sheet which will convey the necessary information in a succinct form without obscurities. Regarding the arrears of fees, which are an unsatisfactory feature of the accounts, it is not clear whether any portion of them is due from those still under education, or whether all the defaulters have left. In the former case their recovery shoud admit of no difficulty, and ought not to be delayed. The attention of the managing committee should be called to this point, which is well worthy their consideration.

11. The connection of Government with the Animal Hospital is only indirect, and in so far as it provides material for clinical instruction to the students of the college. It is unnecessary to comment upon the report of its working for the year further than to observe that it appears to be securing increased popularity, and, it may be hoped, is giving material aid to the Society for the Prevention of Cruelty to Animals, by showing the advantage of proper treatment, and discrediting the irrational and often inhumane methods so largely prevailing.

12. Mr. Steel's reports give evidence of sustained interest and zeal in the conduct of his duties, and the development of veterinary education and practice, from which much future public benefit may be anticipated.

THE VETERINARY DEPARTMENT OF THE UNIVERSITY OF PENNSYLVANIA.

PROFESSOR OSLER, of the Pennsylvania University, gives the following sketch of the Veterinary school annexed to that seat of learning, with the view of showing its capabilities and prospects.

"The authorities of the University of Pennsylvania undertook an ambitious experiment, when, four years ago, they founded the Veterinary Department. The plan was deliberately laid some time before, and as the proper person to undertake it did not appear to be available, Dr. Rush Shippen Huidekoper, one of the Demonstrators of Surgery in the Medical Faculty, a man of recognised energy and capacity, was asked to go abroad and in the best European schools qualify himself for the task. On his return, in 1883, the scheme was matured, and in October, 1884, the school was opened with twenty-nine matriculates.

"The intention from the outset was to furnish an education in veterinary medicine on advanced lines, and the curriculum of study was modelled on the basis of the French and German schools, with a preliminary examination and a graded course of studies extending over three years, with sessions of nine months' duration. During the first year instruction was given only in the elementary branches, and it was not until the session of 1885-86 that the infirmary buildings were completed. The course of study is most extensive and thorough, and, with the exception of Harvard, longer than in any medical school in the country. In the first year the subjects studied are chemistry, materia medica and pharmacy, histology, botany, zoology, veterinary anatomy and forging. A very special advantage in this session is the courses which the students take in botany and zoölogy at the Biological Department. I feel convinced, from my Montreal experience, that this is a most beneficial plan for veterinary students, as it not only extends their knowledge, but tends greatly to heighten their appreciation of the scientific aspects of the profession.

"In the second year the subjects taught are medical chemistry, physiology, therapeutics, general pathology and morbid anatomy, veterinary anatomy,

zoology, surgical pathology and internal pathology, and the contagious diseases. The general pathology and chemistry are taken at the medical school, where the students have the advantage of the extensive chemical laboratories.

"In the third year the subjects of the curriculum are therapeutics, general pathology and morbid anatomy, surgical pathology and operative surgery, internal pathology and the contagious diseases, sanitary police, obstetrics, and zoötechnics. In the second year the student attends clinics, while in the third year he is placed in charge of sick animals, prepares the clinical reports and makes autopsies.

"The teaching facilities of this school are exceptionally good, equal to many of the European, and superior to most veterinary colleges of this country. The explanation is simple—more money has been spent. The situation has been most fortunately chosen, and when the projected botanical garden is arranged, the place will rival in beauty of surroundings the Berlin school. The Infirmary stables are commodious and well arranged, and there is a separate department for irrigation and baths. The dog kennels are large and roomy, and a distant portion of the building has been assigned for an experimental station. One of the special features of the school is the farriery—a cut of which is given—in which the student has to learn practically all the details of normal and pathological shoeing. The dissecting room, the histological, physiological and pharmaceutical laboratories are arranged on the most modern plans, and by the exertion of Dr. Huidekoper the museum is annually enriched by valuable specimens, particularly in comparative osteology.

"After an existence of four sessions, we should be able to form some idea of the prospects of the school. Naturally, with strict requirements and a prolonged course, a large number of students could not be expected; but in the session of 1886-87 there were forty-nine in attendance, and the first graduating class contained eleven men. In the session just completed the number was fifty-six, and there were thirteen graduates. The chief difficulty in maintaining a high grade school is the heavy expense entailed in the costly laboratory and hospital equipments. The income derived from the students, necessarily limited in number, is insufficient for maintenance, and endowment is absolutely necessary. The State may be looked to for material assistance, as the very existence of such a school in our midst is of the greatest possible benefit to the agriculturist; but in the future, as in the past, it is to generous citizens, like the late Mr. J. B. Lippincott, that the school must look for endowments. The practical success so far attained has been due to the unceasing exertion of Dr. Huidekoper, who has devoted himself early and late to the interests of the school. The University has indeed been fortunate in securing a man to organise the department who has high aims, a proper conception of the dignity of his profession, and, above all, a due appreciation of the fact that education in any line of life, to be worthy of the name, must be thorough."

THE NATIONAL VETERINARY BENEVOLENT AND MUTUAL DEFENCE SOCIETY.

A GENERAL meeting of the members of the above Society was held at the Blackfriars Hotel, Manchester, on September 9th, the PRESIDENT (P. Taylor, Esq.) in the chair, among those present at the meeting being Messrs. T. Greaves, T. Hopkins, W. Whittle, S. Locke, T. Briggs, W. A. Taylor, J. B. Wolstenholme, and the Secretary.

Letters of apology for non-attendance were received from Messrs. E. Faulkner, Prof. Walley, R. S. Reynolds, and A. Gibson.

The minutes of the last general meeting having been read and confirmed, as well as those of the various Council meetings,

The PRESIDENT addressed those present on the benefits to be derived from becoming a member of the Society, and illustrated his remarks by reference to various important actions that had been brought against members since the last meeting. He also referred in very feeling terms to the death of several members of the Society, some of them having been members of the Council.

The SECRETARY and TREASURER then read their reports, from which it appeared that there had been a falling off in membership from deaths and neglect in members paying their subscriptions.

Meetings had been held in Manchester, Liverpool, Birmingham, Edinburgh, and London. Many Council meetings had also been held, and hundreds of miles travelled by the officers of the Society and several members of the Council, entirely at their own cost, printing, postages, and the hire of rooms being the only items charged to the funds; while they have expended on fifteen actions brought against members a sum of £325, and on the widows and orphans of deceased members a sum of £220. In many cases, the Council have had to refuse assistance to widows and orphans, from the fact that their husbands were not members; the Council regretted this very much but the rules left them no option. The present funds amount to £2,724, and new members and their families are entitled to the same privileges as those who joined the Society twenty-three years ago, when the subscription annually was double the amount, and the funds in hand *nil.*

The following were elected officers and Council: P. Taylor (President); R. S. Reynolds (Vice-President); Thos. Greaves (Treasurer); Geo. Morgan (Hon. Sec.); T. Briggs, J. S. Carter, T. Hopkins, J. Lawson, S. Locke, R. C. Trigger, W. A. Taylor, W. G. Schofield, Wm. Whittle, Prof. Walley, Prof. Williams, and W. Woods.

Mr. S. LOCKE gave notice of his intention to alter Rule 2, regarding entrance fee and subscription.

A unanimous vote of thanks was passed to the members of the Scottish Metropolitan Society for their contribution of twenty pounds to the funds.

A hearty vote of thanks to the PRESIDENT for his services in the chair terminated the proceedings. GEORGE MORGAN, *Hon. Sec.*

Obituary.

Mr. F. T. Welham, M.R.C.V.S., of Brentwood, died under melancholy circumstances on September 22nd. It appears that he returned home about midday, after attending some cases, and being unwell, he went to bed, and endeavoured to get to sleep. Failing in this, he drank some chloral, for the purpose, it is supposed, of inducing sleep; but he took an overdose. He at once discovered his error, and calling to his wife, told her he had poisoned himself, and asked for some oil and water. She immediately administered some oil, but it was unavailing, and before medical assistance could arrive death ensued. Mr. Welham was forty-one years of age, and leaves a family of six children. He graduated in 1867, and was for some time an Inspector under the Privy Council in Ireland.

Another painful case of death of a member of the profession occurred also in September. Mr. B. R. Kirk, M.R.C.V.S., Huddersfield, was found dead in

his bedroom, death being due to accidental burning while no help was at hand.

The following deaths have also been reported: E. J. Browne, M.R.C.V.S., Brighton, who graduated in 1850; J. W. Canty, M.R.C.V.S., Listowel, who graduated in 1880; R. Bareham, M.R.C.V.S., Faston, who graduated in 1843; J. White, M.R.C.V.S., Chirnside, who graduated in 1835; S. W. Slattery, M.R.C.V.S., St. Louis, U.S.A., who graduated in 1877.

In our last issue we referred to the melancholy death of Mr. Graham Mitchell, F.R C V.S., of Victoria, Australia, and since then we have received from the colony abundant evidence of the esteem in which he was held and the regret his untimely death has occasioned. At a meeting of the Council of the National Agricultural Society of Victoria, held on June 15th, Mr. McGregor "drew the attention of the meeting to the death of Mr. Graham Mitchell, F.R C.V.S., the Honorary Veterinary Surgeon of the Society. He moved that the regret of the Council be recorded in the minutes at the loss sustained through the death of their honorary officer. Seconded by Mr. Lobb, who stated that from a long acquaintance with the deceased he had pleasure in bearing testimony to his being one of the very best-hearted of men. Carried." And in the Journal of the same Society there appears the following sympathetic notice: "It is with sincere regret that we chronicle the sudden and unexpected death of Mr. Graham Mitchell, F.R.C.V.S., Honorary Veterinary Surgeon of the National Agricultural Society of Victoria, which occurred on the night of the 4th June, from Heart Disease. Mr. Mitchell was the son of a Presbyterian clergyman, and was educated in Edinburgh, being a pupil of the celebrated Professor Dick, at whose college (the Royal) he obtained his diploma. He came to the colony in 1855, and settled down at Kalkallo, whence he removed to Kirk's Bazaar, Melbourne. He experimented successfully with inoculation for Pleuro-pneumonia in cattle, and subsequently went to India for three years, under a professional engagement. Here he became acquainted with Mr. Rutherford, the veterinary surgeon who came down with Mr. Mitchell from India and investigated his system of inoculation, which he (Mr. Rutherford) afterwards practised with great success in the dairy herds in Glasgow. In connection with the Cumberland Disease, Foot-and-mouth Disease, etc., Mr. Mitchell was very widely known. He also successfully cultivated vaccine lymph, and vaccinated children directly from the calf. His system was pronounced a great success by the Hon. Graham Berry, then Chief Secretary, and a number of leading medical gentlemen who visited his depôt at the Royal Park by invitation and saw the vesicles on the calves, as well as on the arms of the children who had been previously vaccinated direct from the calves. In 1882 Mr. Mitchell established the *Australian Veterinary Journal*, of which he was editor. He also contributed largely to the general literature of veterinary science, and occasionally wrote for the veterinary column of this journal, while two days before his death he read a paper on 'Stringhalt in Horses,' before the West Bourke Agricultural Society. Mr. Mitchell was a man of splendid courage and daring originality, and was also remarkably well informed; for he possessed an excellent library, to which he constantly added the newest works, and he subscribed to the leading veterinary journals of Great Britain and America, and spared no expense in obtaining the latest veterinary instruments and appliances; so that he was a perfect mine of valuable information, and unlike many babblers who prate twaddle, could always give an intelligent and intelligible reason for the opinions he expressed. By his death the colony, and, indeed, the world, loses an undoubtedly able man—one whose ability, like that of many other fearless and original men, his contemporaries really fail to fully recognise and justly appreciate."

Army Veterinary Department.

Gazette, September 4th.

21ST HUSSARS.—Veterinary Surgeon John Robert Beech, C.M.G., to be Second Lieutenant, in succession to Lieutenant H. C. Higgs, promoted; Second Lieutenant John Robert Beech, C.M.G., is seconded for service with the Egyptian army.

We would direct attention to this most unusual notification in the *Gazette*. Up to the date of its appearance there was only one instance on record of a Non-Combatant receiving a Commission as a Combatant Officer, and that was when Assistant-Surgeon H. Wilkin, of the 11th Hussars, received a Cornetcy in that regiment for rescuing H.R.H. the Duke of Cambridge from capture by the Russians at the Battle of Inkerman, in the Crimea, in 1854.

There is no provision in the Royal Warrant for such transfer, and since 1854 there has been no occasion to invoke the Queen's prerogative in such a case. On representation being made to the Horse Guards of the desire of Mr. Beech to receive a Commission in a cavalry regiment, the Commander-in-Chief, ever ready to consider the claims of officers of the Veterinary Department, recommended to the Secretary of State for War that such Commission be awarded Mr. Beech, in acknowledgment of his meritorious services with the Egyptian Expedition of 1882-84, and Soudan Expedition of 1884-85, but more especially of the prominent part he took in Portal's Mission to the King of Abyssinia recently, together with the high testimony he received from the Sirdar of the Egyptian Army as to his excellent qualities as an officer. The occurrence reflects great honour on Mr. Beech, no less than on the veterinary officers of the army, who, in regretting the loss of a colleague who has so well played his part in the profession, must wish him still more success in the new sphere to which his good fortune has carried him. This is another instance of the rapid progress the Department has deservedly made in the estimation of the Military Authorities, and is a further proof that no obstacle now exists to veterinary officers receiving adequate consideration and reward equally with other officers.

The extraordinary event has caused much comment in military circles, and service papers have, of course, noticed it. The *United Service Gazette* of September 8th says: "The appointment of Veterinary Surgeon J. R. Beech, C.M.G., from the Veterinary Department to a second lieutenancy in the 21st Hussars, is a transfer of an unusual character, and although a great loss to the department in which this officer has for some time served with conspicuous ability, it will be a decided gain to the cavalry."

Veterinary Surgeons Crow, Hagger, and S. M. Smith have sailed for a tour of service in India, and Messrs. Gladstone and Betser are under orders to embark for that country. Mr. Braddell has returned from a tour of service in India, and is attached to the 11th Hussars in Dublin.

Mr. Steel, who came home on sick leave, has made so little progress towards recovery from his illness (abscess in the liver), that it is probable he will require an extension of leave.

Veterinary Surgeon R. W. Burke has successfully passed an examination in the Higher Standard of Hindustani.

Notes and News.

EQUINIA IN SWITZERLAND.—A correspondent of *The Lancet* writes from Geneva:—"The rural district of Vandœuvres has been thrown into consternation by cases of Glanders (*morve chevaline*, as the local physicians call it) in the human subject, two of them having already terminated fatally.

The facts are these. A prominent landed proprietor had, a year or two ago, purchased a horse which, to all appearance, was sound in wind and limb, and up to within the last few weeks betrayed no sign of any malady. In June, however, one of the grooms (Bouvier by name) was taken ill, and had to go to the hospital, where he was pronounced to be suffering from severe whitlow. Instead of getting well, he rapidly became worse; but, probably from his exceptionally good constitution, he is regarded as not unlikely to recover. His successor (one Dupuis) was little more than a fortnight in service when he too sickened, and, after fourteen days' acute suffering, died. By this time suspicion was aroused as to the horse—the general opinion being that it was glandered. Presently Dupuis' father, who, from occasionaly helping in the stables, took his son's place, became ill also. The physician, who had been struck with the unusual symptoms in Dupuis *fils*, as to which he could not make up his mind, on recognising the same presenting themselves in the father, called in two colleagues in consultation. The opinion arrived at was that father as well as son had contracted the contagion of *morve chevaline* in its most malignant and rarely curable form; and, indeed, Dupuis *père* soon succumbed, after some days of great suffering. Bouvier, the first attacked, still struggles with the malady, but, as already said, is considered as in a not quite hopeless condition. At the instance of its owner the horse was slaughtered, and the *post-mortem* examination placed the fact of its suffering from Glanders beyond doubt. What adds to the popular alarm is the existence of the same symptoms, though of a less pronounced kind, in other horses of the neighbourhood."

ACTINOMYCOSIS IN MAN.—M. Nocard recently reported to the Académie de Médecine a case of Actinomycosis, which is the first in which this disease has been observed in the human subject in France. The patient was a stable boy in whom, after certain injuries to the left buttock and thigh in the spring of 1887, what seemed to be deep-seated chronic abscess developed in the limb. This was opened in July, but other abscesses appeared in October and November. The pus contained a considerable number of small white bodies which, on microscopic examination, were found to be masses of actinomyces. In July, 1888, there was still an obstinate fistula which from time to time became inflamed and discharged pus presenting the characteristics already described. The patient is now able to walk, and his general health is better than it was, but he is not cured.

THE BACILLUS OF GLANDERS.—At a recent meeting of the Academy of Medicine, Prof. Babès, of the Faculty of Medicine of Bucharest, communicated the result of his researches on Glanders, an affection rather common in Roumania in man as well as in the horse. He had an opportunity of examining three persons, who had died with all the symptoms characteristic of this malady. The infection was the result of their contact with horses affected with Glanders. At the necropsy, masses of bacilli were found in the blood. He also observed, by the aid of numerous experiments, that the bacillus of Glanders may penetrate into the skin, without any solution of continuity in the latter, in following the hairy follicles where it multiplies. It then traverses the epithelial cells and produces infiltrations of the embryonic cells under the form of patches and of papulæ, which constitute the origin of ulcerations of the skin.

TOBACCO SMOKING.—Opponents of tobacco in Paris point with great satisfaction to M. Chevreul, whose 102nd anniversary is celebrated to-day, as a non-smoker. The same people also put forth another non-smoking centenarian of France—M. Renaudin—who is 104 years old, was present at the battle of Waterloo, reads and writes without spectacles, is not hard of hearing, and

is, in fact, according to the anti-tobacco leaguers, a perfect ancient phenomenon possessing all his faculties intact. M. Renaudin lives at Ville-Evrard, and was a veterinary surgeon by profession

PROLONGED STARVATION.—A pony, the property of a man named Bowden, of Mold, was recently lost, all search proving fruitless. After the lapse of some days it was suggested that a culvert which conveys water from an adjoining colliery should be searched. This was done, and there the pony was found up to his belly in mud and water. He had spent eleven days without food in the foul air of this channel. The culvert was too narrow to allow of the creature being turned, and men had to dig down for several feet to rescue it.

THE EFFECTS OF EARTHQUAKES ON THE LOWER ANIMALS.—In the last issue of the "Transactions of the Seismological Society of Japan," Professor Milne, the well-known student of volcanic phenomena, discusses the effects of earthquakes on animals. The records of most great earthquakes refer to the consternation of dogs, horses, cattle, and other domestic animals. Fish also are frequently affected. In the London earthquake of 1749 roach and other fish in a canal showed evident signs of confusion and fright; and sometimes after an earthquake fish rise to the surface dead and dying. During the Tokio earthquake of 1880 cats inside a house ran about trying to escape, foxes barked, and horses tried to kick down the boards confining them to their stables. There can, therefore, be no doubt that animals know something unusual and terrifying is taking place. More interesting than these are the observations showing that animals are agitated just before an earthquake. Ponies have been known to prance about their stalls, pheasants to scream, and frogs to cease croaking suddenly a little time before a shock, as if aware of its coming. The Japanese say that moles show their agitation by burrowing. Geese, pigs, and dogs appear more sensitive in this respect than other animals. After the great Calabrian earthquake it is said that the neighing of a horse, the braying of an ass, or the cackle of a goose was sufficient to cause the inhabitants to fly from their houses in expectation of a shock. Many birds are said to show their uneasiness before an earthquake by hiding their heads under their wings and behaving in an unusual manner. At the time of the Calabrian shock little fish like sand-eels *(cirricelli)*, which are usually buried in the sand, came to the top and were caught in multitudes. In South America certain quadrupeds, such as dogs, cats, and jerboas, are believed by the people to give warning of coming danger by their restlessness; sometimes immense flocks of sea-birds fly inland before an earthquake, as if alarmed by the commencement of some sub-oceanic disturbance. Before the shock of 1835 in Chili all the dogs are said to have escaped from the city of Talcahuano. The explanation offered by Professor Milne of this apparent prescience is that some animals are sensitive to the small tremors which precede nearly all earthquakes. He has himself felt them some seconds before the actual earthquake came. The alarm of intelligent animals would then be the result of their own experience, which has taught them that small tremors are premonitory of movements more alarming. Signs of alarm days before an earthquake are probably accidental; but sometimes in volcanic districts gases have emanated from the ground prior to earthquakes and have poisoned animals. In one case large numbers of fish were killed in this way in the Tiber, and at Follonica, on the morning of the 6th of April, 1874, "the streets and roads were covered with dead rats and mice. In fact, it seemed as if it had rained rats. The only explanation of the phenomena was that these animals had been destroyed by emanations of carbon dioxide."

PROTECTIVE INOCULATION AGAINST ASIATIC CHOLERA.—At a meeting of the Paris Académie de Médecine on August 21st, M. Pasteur presented an important

communication from Dr. N. Gamaleia, of Odessa, in which that gentleman claimed to have discovered a method of preventive vaccination for Cholera. He began by pointing out that although ordinary cultures of the cholera microbe were so slightly virulent that Koch believed Cholera was not inoculable in the lower animals, it was possible to intensify its virulence to an extreme degree by conveying it to pigeons after it had passed through the guinea-pig. It produced in the former a fatal form of "dry" Cholera, with exfoliation of the intestinal epithelium. The microbe was found in the blood of pigeons which had died of the disease so induced. After passing through several pigeons the microbe acquired such virulence that one or two drops of the blood of an inoculated bird sufficed to kill healthy birds in from eight to twelve hours, whilst an even smaller dose proved fatal to guinea-pigs. If the virus obtained after passing through pigeons is cultivated in nutrient broth, and is afterwards exposed to a temperature of 120° C. for twenty minutes, it will be found that there is left in the sterilised culture a toxic substance which produces characteristic phenomena in animals. If four cubic centimètres of the sterilised broth be injected into a guinea-pig, the animal's temperature gradually falls, and death takes place in from twenty to twenty-four hours. Pigeons die in the same way, but require a larger quantity, namely, twelve cubic centimètres injected in one dose. On the other hand, if the same quantity of the sterilised fluid is injected, but in two or more doses given at intervals of a day or two, they do not die, but are found to have become refractory to Cholera to such an extent that even half a cubic centimètre of the most intense virus (the blood of an inoculated pigeon) is not fatal to them. Guinea-pigs are still more easily vaccinated by injecting the sterilised broth in doses of two cubic centimètres once or twice repeated. Dr. Gamaleia has found this *chemical* vaccine of unfailing efficiency and perfectly innocuous. He admits that he derived the idea of it from a paper of M. Pasteur's on the chemical vaccine of Rabies, and from Dr. Roux's experiments on Septicæmia. He offers to repeat the experiments in M. Pasteur's laboratory, in presence of a committee of the Académie des Sciences. He further vulunteers to test the method on himself in order to determine the question of its applicability to man and the dose of the vaccine required, and states that he is prepared to undertake a journey to the countries where Cholera prevails with the view of proving the value of his discovery. M. Pasteur, after reading the communication, said he would be glad to place his laboratory at the disposal of Dr. Gamaleia, who had already worked therein on more than one occasion. In 1886 he had been sent to Paris by the Odessa municipality to study the method of preventive inoculations for Hydrophobia, which he had since applied with great success in his native country.

Dogs in London.—During the month of August 1,296 stray dogs were taken to the Dogs' Home, Battersea, by the Metropolitan Police, twenty-four mad or ferocious dogs were killed in the streets by the police, and five by private persons. Four other dogs were certified as suffering from Rabies, and ten from Epilepsy. The number of persons known to have been bitten by dogs was 150, including four constables.

Veterinary Medicine in Japan.—A writer in the *Japan Gazette* draws attention to the lamentably slow progress made in the Land of the Morning Sun, as the Japanese are pleased to designate their country; and among other instances he mentions that in the capital, Tokio, "There is not a single veterinary surgeon and in Japan about £6,000 of horse-flesh is ruined every year for want of the most ordinary care and attention, and twenty per cent. per annum in usefulness taken out of the remainder. There is room for fifteen or twenty good veterinary surgeons in Tokio alone."

PASTEUR'S TREATMENT.—During the month of May, 161 persons were treated at the Pasteur Institute. Out of this number forty-five were bitten by animals in which the existence of Rabies was proved experimentally; ninety-seven were bitten by animals certified to be rabid by veterinary surgeons, and fourteen were bitten by animals suspected to be suffering from Rabies. Out of this number two died. In both the fatal cases the bites involved the face, and were very severe. They came under treatment the second and fifth day respectively.

RABIES IN IRELAND.—An alarming outbreak of Rabies is reported from County Meath, which has led to the postponement of cob-hunting and the destruction of many dogs. Several people have been bitten, and some of them have been sent to M. Pasteur for protective treatment.

CONTAGIOUS DISEASES IN EGYPT.—The first authentic case of Rabies occurred in Egypt in August, 1886, and in the following January a second case was found in an English dog in Cairo; while in June, 1887, a third case was reported from a village near Cairo, the dog having bitten eleven individuals, three of whom are said to have died of Hydrophobia. This small record of Rabies is very satisfactory, when it is remembered that Egypt contains thousands of dogs in a half savage condition. During the past year there were eighteen cases reported, and probably others unreported, of Glanders and Farcy, but none communicated to man. Pleuro-pneumonia occurred among buffaloes and bullocks in three different provinces, but was easily checked by the sanitary measures adopted.

TEXAS FEVER.—Losses by Texas fever are reported from Parsons, Kansas, as follows: "The dreaded Spanish cattle fever has broken out among the cattle in the southern part of this county, and fears are entertained that many herds have been inoculated. About two weeks ago H. Milliken and W. M. Willey, farmers living near Valleda, discovered the disease among their herds, then in the Indian Territory. Thinking a change of location would stop the ravages of the disease, they drove their cattle to their home farms. Since their removal Milliken has lost forty-five and Willey nineteen head, with many more showing signs of the disease and dying. The state authorities have been notified of the situation, but they have done nothing."

VEGETABLE PATHOLOGY.—A laboratory of vegetable pathology for the study of the diseases of plants and the means of remedying or preventing them has recently been established in connection with the French Institut National Agronomique. This is certainly a step in the right direction, and one that might with much advantage be imitated elsewhere. Pathology will never be truly scientific till it is made to include the whole of organic life.

Correspondence.

THE VETERINARY SURGEONS ACT OF 1881.

DEAR SIR,—Few members of the profession will, I think, question the ultimate benefits to be derived from the above Act, although most of us, I doubt not, fail to discover much (if any) immediate advantage.

As you observe in the August number of the Journal: "There is no law to prevent any one practising who is not in the Register of Veterinary Surgeons, so long as he does not designate himself by a title which might lead

the public to infer that he is registered, but he cannot recover fees in a court of law"—that is to say, anybody may practise veterinary surgery if he can only make it worth his while to do so; and the fact remains that any persons, qualified or not, may castrate colts, cut pigs, "dock" horses, and "crop" dogs' ears, etc., etc., with impunity, so long as the public employ them to do it.

To protect our profession, we require to first make its members thoroughly acquainted with all the details of the *legitimate* science and art of the profession, and to educate the public to acknowledge and be *satisfied* with them. Until the latter is attained, however, I am persuaded that our members require to know, in addition to the above (I am even tempted to say *only*) the *illegitimate* practices of the art, and not be ashamed to perform them, for until the public are educated beyond their present standard respecting the duties of the veterinary surgeon, I am afraid, Act or no Act, "quacks" will exist. The problem to solve, then, is, How can we educate the public? I will leave this to you, and suggest that steps should be taken to prevent those on the register from placing themselves *falsely* before the public, and *as far as possible* prevent those not on the register from practising veterinary surgery altogether. The latter appears difficult, since an owner of animals may employ whomsoever he will to attend his stock, and the only way, in my opinion, that we can get rid of this is to show them that the qualified veterinarian's services are *pecuniarily* more to his advantage than are those of the "quacks," since my experience leads me to think this is the method by which such persons can gauge our ability and usefulness. The former is, however, I think, within our grasp, if we could only organise a body of representatives who would be willing, capable, and bold enough to undertake the task if we found the "needful" £ s. d. We can, as Mr. Dyer says, "hardly expect individual members of the College to take upon themselves the onus of prosecuting such individuals." Neither do I think we can expect the funds of the R.C.V.S. to defray the expenses, and possibly it is asking too much of our hard-worked representatives, who have—judging from *last* year's work—shown themselves to be about as weak a set of men as we could possibly select, to take up such disagreeable, although necessary labour.

Personally, I consider there should be a special committee to consider each case on its merits as submitted to them, and settle whether it is advisable or not to enter "an action," and if so, a fund—say collected by an annual subscription, or voluntarily if you like—placed at their disposal to defray any expenses.

I shall be pleased to subscribe my share, and render any assistance I can to the formation of such a committee, if the profession consider it worth considering. I should be glad to hear the opinions of other members of the R.C.V.S., either by personal communication or through the VETERINARY JOURNAL.

GEO. A. BANHAM.

Downing Street, Cambridge.

SIR,—We have read much of late about the inactivity of the Council of the R.C.V.S. regarding putting the V.S. Act in force to suppress and punish farriers and other non-registered men styling themselves and practising as V.S. The members of the Council press us closely for our votes to elect them to the post, but, after getting their own purpose served, they leave us to take care of ourselves. What is the use of the Council unless they act as our representatives and further our interests?

Some seven years has now elapsed since the passing of the V.S. Act., and,

for what use it has been, we could have done without it. It has given the registered farriers of the metropolis power to use our title of V.S., the majority of which may be seen daily working in the forge as ordinary farriers. Again, as to the non-registered farriers, they use the term "Veterinary," and practise with impunity.

The "Act" was intended to prevent and suppress non-registered and convicted men from practising.

We are told by the Council that they cannot take steps to prosecute the non-registered farriers and others for practising and using the term "Veterinary," etc.

The Council say it is not sufficient proof for them to prosecute those men who have the terms M.R.C.V.S, Veterinary Surgeon, etc., over their doors. They must have a bill-head or card with the above terms on it before they can take steps to prosecute. What better proof do the Council want than these public exhibitions?

The following are a few specimens of these men's boldness in styling themselves on their boards:—

(1) Chiswell & Co., Veterinary Surgeons, M.R.C.V.S. Infirmary for Horses and Dogs. Contracts taken for Shoeing and Doctoring. New Road, Whitechapel, E.

(2) Williams & Wederall. Infirmary for Horses and Dogs. Grove Street, Commercial Road, E.

(3) Alfred Alp. Cures Quittors, Sandcracks, Cankers, etc. Cannon Street, E.

Neither of the above are on the V.S. register. What more proof does the Council want than these descriptions on the signboards over the forge-doors? They are more public and of more proof than cards, etc. Some men do not go so far, but yet they are practising and leading the public to believe that they are V.S. They do not have any terms on their boards, etc.

There is room for a clause to be inserted in the V.S. Act to prevent and suppress non-registered men from practising, even if they do not use any terms.

The legal, dental, and other professions take steps to prevent, suppress, and punish men practising illegally; and they make a public example of the miscreants.

Why should the veterinary profession be backward in doing likewise?

H. GRAY.

Stratford, E., *August* 29, 1888.

AN ARMY RESERVE OF VETERINARY SURGEONS.

DEAR SIR,—As a reserve of medical officers has been formed, I think we should not be behind hand in forming a reserve of veterinary officers. On looking through the Army List, I see there are a number of yeomanry cavalry regiments without veterinary surgeons. The cause of this I do not know. It might be the expense of the outfit or the small pay.

If I might make a few suggestions, I should propose that all yeomanry veterinary surgeons should be on the reserve of veterinary officers; that they should be under the control of the Principal Veterinary Surgeon of the Army, and be connected with the Army Veterinary Department. Instead of wearing the regimental uniform, they should wear the departmental, which would be less expensive, and a small annual allowance might be allowed

for being in the reserve. That length of service should count for higher rank. They should be honorary members of the regimental mess to which they are attached.

By the formation of such a reserve, we should always have an efficient body of practical men ready to do duty when required. In some yeomanry regiments the status of the profession has been forgotten, by members being content to take the appointment of veterinary surgeon without a commission, which they are entitled to.

I think yeomanry veterinary surgeons will see the importance of such a step; also other members of the profession who will be in the reserve. I know that you, sir, will do all that you can to give the subject space for discussion in your valuable journal, and also that you will approve of this important scheme, as you are ever ready to lend a willing hand to raise the status of our noble profession.

GEORGE F. PICKERING, *V.S., Yorkshire Hussars.*

York, *September 23rd.*

DESCRIPTIONS OF COW-POX, AND THE VETERINARY AND MEDICAL SCIENCES.

SIR,—In a recent number of the *British Medical Journal*, Dr. Jenner's description of cow-pox, Ceely's description of cow-pox, and a German and French description of this disease are given. I do not propose inquiring into all the descriptions of this disease in cows which have been published, but I may ask, Why has Chauveau's description of cow-pox as given in France, and Fleming's description of cow-pox as given in our own country, been omitted from the above list? Is it that they are veterinary surgeons, and English doctors try to ignore the work of veterinarians? or can it be that we do not know our own work, and must ever look up to medical men to pave the way for veterinary practice? But I contend that it is not sufficiently widely known that veterinarians do at least know something of the pathology of cow-pox (see its literature), and say that the assertion is still received by many medical men with great incredulity. Why is it so? There must be a reason for it. Is it because we are not called "Doctors"? Then the remedy is very simple, it appears to me. Introduce a Doctor's degree, corresponding to our Fellowship degree, and call veterinarians Doctors of Veterinary Science, if you will, and the trouble is easily tided over. In America this plan was adopted, and at once medical men stretched out the hand of friendship to veterinarians, not because they are different men, but because they are now called "Doctors," and before they were only veterinary surgeons. Surgeons in the Army and in private practice prefer the title of Doctor, and so do veterinary surgeons. Why not institute a system of examinations then, which shall confer on the successful candidates the title of Doctor of Veterinary Science, similar to that granted in human medicine?

It is somewhat more gratifying to see an article on Tuberculosis by Dr. Woodhead in a recent number of the *Lancet*, in which several veterinary authorities are mentioned, but in such a way as to make it quite unintelligible whether they are veterinary or medical writers quoted. And notwithstanding the definition of the term Doctor recently given by the editors of the *Lancet*, they still prefer to speak of "Dr. MacFadyean" in coupling his name with that of Dr. Woodhead in their researches on Tuberculosis in cattle. "We still maintain," say the editors of the *Lancet*, "that it is to the pathologist we must look for the full solution of the problems of disease." We quite agree with

the *Lancet*, provided that the pathologist embraces in his inquiry not merely the lesions discovered in the human patient, but those also noted in the lower animals, and all the peculiarities of the disease in these.

We have little doubt that co-operation, for which the nineteenth century is daily affording better facilities, is destined to promote that progress which is essential in every walk of scientific investigation, to conduce to harmony of method and result; and it is in keeping with this fact that the universities on the continent of Europe, both in their professoriate and in other places of trust under Government, are more numerously and characteristically represented than those of any other country. Imperfectly as these advantages may yet be appreciated, illustrations of what the lack of them implies have been frequent of late years, especially in England—the Scarlatina discussions having lately shown how much more effective for good they might have been had the intercommunion of study and thought been availed of during the earlier part of their investigations.

A FRIEND.

India, *Aug.*, 1888.

DR. FLEMING'S OPERATION FOR ROARING.

DEAR SIR,—I have no doubt it will be interesting to the members of the profession to know that the two horses operated upon for Roaring, by Professor F. Smith, during the annual meeting of the National Veterinary Association held in this city on July 18th, are, up to the present, no better. Both are bad grunters, and upon the slightest exertion make as much noise as ever.

GEORGE ELPHICK.

Newcastle-on-Tyne, *Sept. 15th.*

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from G. A. Banham, Cambridge; H. Gray, Stratford; J. Gordon, Queensland; F. Raymond, A.V.D., Woolwich; A. E. Macgillivray, Banff; Professor McCall, Glasgow; R. W. Burke, A.V.D., India; "A Friend;" S. Bailey, Oldham; T. Chalwin, Adelaide, S.A.; S. E. Nash, Richmond, Yorks; J. B. Hal'en, Simla; Messrs. Arnold and Sons, London; P. S. Hutchinson, London; Professor Walley, Edinburgh; G. Morgan, Liverpool; G. T. Pickering, York; J. Malcolm, Birmingham.

BOOKS AND PAMPHLETS: Scientific Memoirs of the Medical Officers of the Army of India; Third Annual Report of the Bureau of Animal Industry for the Year 1886; *E. Crookshank, M.B.*, An Investigation of an Outbreak of Cowpox in Wiltshire; *F. S. Billings*, Swine Plague.

JOURNALS, ETC.: *Journal of National Agricultural Society of Victoria; Quarterly Journal of Veterinary Science in India; Echo Vétérinaire; Recueil de Méd. Vétérinaire; Annales de Méd. Vétérinaire; Lancet; Revue Vétérinaire; British Medical Journal; Thierarzt; Wochenschrift für Thierheilkunde und Viehzucht; London Medical Record; Hufschmied; Giornale di Veterinaria Militare; Forest and Stream; Clinica Veterinaria; Deutsche Zeitschrift für Thiermedicin und Vergleichende Pathologie; Live Stock Journal; Edinburgh Medical Journal; Journal de Médecine Vétérinaire; American Live Stock Journal.*

NEWSPAPERS: *Times of India; Melbourne Herald; Newcastle Daily Journal; Pioneer; Leeds Mercury; Morning Chronicle.*